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THE CONDOMINIUM REMEMBERED

Proceedings of the
Durham Sudan Historical Records
Conference 1982

Volume 2:

THE TRANSFORMATION OF THE OLD ORDER IN THE SUDAN

Edited and Introduced by
DEBORAH LAVIN



9 AUG 1995

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The cover photograph shows Nuba inspecting a Sudan Airways Dove, Dilling airfield, 1950s.

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INTRODUCTION

Deborah Lavin

The transformation of the old order in the Sudan is the second volume of *The Condominium remembered*, the proceedings of the Durham Sudan Historical Records Conference held in Trevelyan College in April 1982. Publication has been unavoidably delayed, yet the material of the conference is a timeless record which produced, as Professor G.N. Sanderson commented 'a torrent of source-material - enough for several lifetimes'. 200-odd participants - old Sudan hands both Sudanese and British - were invited, chosen to include as far as possible all the generations up to the transfer of power in 1956 and to reflect a variety of occupations and ranks in the Sudan services. We asked the Chairmen of the nine sessions each to commission the papers of his panel and relate the papers to each other in discussion. We particularly requested that all contributions, whether written or spoken, bear the stamp of personal experience and spontaneous comment, though we suggested some questions as a focus for reminiscence. The resulting conference was memorable for its good stories and good humour: the few historians present, silent onlookers, commented later on the apparent absence of abrasive dispute or profound conflict of ideals among a generation whose shared experience centred on a single country.

A number of the papers were historical, and one possible presentation of the conference proceedings would have divided the papers in chronological rather than thematic sequence. In the end the thematic approach was chosen because it was then possible to introduce excerpts from the valuable discussions in relation to the papers that prompted them. The record on administration, law and the police, defence and the transfer of power can be found in Volume I, *The making of the Sudanese state*. The themes of the second volume trace economic, technical and social ground that is less familiar as a matter of record. The work of the Survey Department and the pioneering contribution of telecommunications engineers or the designers of ships touch on important themes that historians of empire are only now beginning to tackle, and also throw important light on the controversies of 'development'.

In this volume some rifts within the common mind are discernible. Repeatedly, the lack of money and the need for economy in the 1930s was stressed: yet others pointed out that the policy of superbly efficient defensive finance was maintained virtually unchanged in the years after the war. Professor Beshir commented on the institutions which effectively formed the psychology of the imperial era - the army, the Gordon College, the Kitchener School - as contributing to reduce Egyptian influence; it was he who was remarked on the two Khartoum Clubs - the Sudan Club for the Political Service, the Khartoum Club

for the non-political and technical Services. Robin Hodgkin's paper formulates some of the tacit assumptions of the educationists (especially those with Indian experience); in discussion it became clear that a good many of these were not shared by members of the Political Service who had worked closely with a generation educated before Bakht er Ruda existed. Most interestingly, later criticisms were forthrightly addressed: the record of the Gezira scheme, the value of the Sudan Medical Service and the education system at transfer, the impact of education, medicine and (in the South) Christianity on traditional attitudes and beliefs, especially the changing position of women.

If there is a sense of anachronism in the record of the conference it comes in the hope for the future that ran throughout the contemporary references in the discussions of 1982. Then it seemed that the civil wars were at an end, that large projects developing the South were on the point of paying a social dividend, that tolerance and peace were perceived objectives, that it might be possible again to speak not of two Sudans but one. Events have proved otherwise: but it is to be hoped that these discussions, themselves models of tolerance and empathetic enquiry, and the Durham Sudan Archive (to the support of which the proceeds of this publication have been assigned) may help to promote that objective understanding of the historic past that has preceded momentous change in many parts of the world since the conference was held.

Acknowledgements

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Part I:
ECONOMIC DEVELOPMENT

ECONOMIC DEVELOPMENT IN THE SUDAN, 1899-1956

Sir John Carmichael

The primary requirement for development in any country, whether economic or social, is the availability of finance. When the Anglo-Egyptian Condominium of the Sudan was established in 1899, internal sources of finance were negligible and the need for the establishment of essential services in administration, justice, education, health care, communications and defence was acute, as was the need for economic development not only to provide better standards of living for the decimated population but also to create new sources of finance which would permit the rate of general development to accelerate. The task of the new administration was indeed daunting.

1899 to 1913

It was accepted by the parties to the Condominium Agreement that the new administration could not be expected immediately to find funds to balance its essential expenditure. Egypt had not only obligations but also definite interest in seeing that the Sudan should become stable and defensible so that its rights to Nile waters could be safeguarded and its irrigation stations along the Nile could operate without hindrance. After the British government had taken Egypt under its tutelage in matters political and military, the British treasury spent more than £13 million in military expeditions to the Sudan between 1882 and 1885. The British government had no designs in the long term either in Egypt or in the Sudan, but recognised the importance of stability in both and insisted that such financial assistance as was necessary to establish viability in the Sudan should be provided by Egypt.

Accordingly, Egypt, under the direction of its British advisers, undertook to make contributions to cover the deficits of normal budget in the early years, and also to make loans available for capital works which were deemed urgently necessary to improve the state of the country. In turn, the Sudan was required to submit its normal budget annually to the Egyptian Ministry of Finance for approval: the amount of the Egyptian subsidy was determined at the same time. Powers of virement were limited. Applications for funds for essential capital works had also to be submitted and, if approved, loan funds were made available.

In 1900 Sudan government revenue amounted to £E156,888 and expenditure to £E331,918, the deficit being £E175,030. By 1912, the figures were £E1,355,635 and £E1,421,334 with a deficit of £E65,699. Thereafter, it was deemed that the Sudan could balance its normal budget and the Egyptian annual

subvention ceased: at the same time Egypt agreed to hand over in future the customs duties it collected on goods passing through to the Sudan (then amounting to some £E85,000). For the 14-year period from 1899 to 1912, the total of the subventions made by Egypt amounted to £E2,871,811.

The Sudan government was in no position to plan major capital works from its own resources, although from 1902 it was allowed to transfer to General Reserve any surplus it could achieve on the budget which was balanced by the agreed Egyptian subvention. In the period to 1913 these transfers amounted to £E1,592,000 and this was allocated for comparatively minor capital works or improvements in the provinces and departments.

The importance of the Egyptian agreement to make loans for approved capital works is illustrated by the following table:

Development Loans From Egypt

	1899-1906	1907-1914	Total
	£E	£E	£E
Railways	2,548,000	1,373,000	3,921,000
Steamers	95,000	-	95,000
Public Works	308,000	101,000	409,000
Telegraphs	19,000	-	19,000
Port Sudan Town and Harbour	685,000	229,000	914,000
Various	57,000	-	57,000
	3,712,000	1,703,000	5,415,000

(Note: the greater part of the aggregate loans from Egypt occurred in the first seven years of the Condominium.)

The allocation to the Railways provided, *inter alia*, for the railway from the Nile to the Red Sea (£E1,687,000), the Abu Hamid/Kareima line (£E269,000), the bridge over the Blue Nile (£E250,000) and the bridge over the White Nile (£E130,000). By 1900 the railway line from Wadi Halfa to the Blue Nile north of Khartoum had been completed, by 1910 the rail link with the Red Sea was

established and by 1912 the railway reached El Obeid. These projects, together with the creation of Port Sudan town and harbour (£E914,000) and improved steamer services and telegraphic services provided a revolution in communications which must have been of immense value to the administration, the social services and the technical services, quite apart from the improvement to trade, both internal and foreign. Government services were also improved by the provision of the loans for public works which included office accommodation, essential housing, hospitals and prisons.

It has already been indicated that it was not until 1913 that a budget surplus was achieved with revenue at £E1,568,000 and expenditure £E1,533,000. The mere figures, however, disguised the fact that they were inflated and greatly supported by the inclusion of the Railways revenue and expenditure at £E701,000 and £E577,000 respectively or a surplus of £E124,000. The aggregate of Railways surpluses for the 14-year period was over £E700,000. That such surpluses could be obtained by the Railways arose from the new facility of transporting goods quickly and simply from place to place. This was a most valuable advantage to traders and, following the principle of charging what the traffic would bear, the Railways could set its rates at levels which ensured for itself a profit. The Railways had also made possible a good growth in foreign trade with imports rising by 1913 to a value of £E2,110,000 and exports (excluding exports of camels to Egypt) of £E1,185,000. Customs revenue had also increased from a low level to £E187,000. The contribution, direct and indirect, of the Railways to the development of the social and technical services and to the financial viability of the government was thus substantial. 1913 can be regarded as the year in which the Condominium came of age because subventions to the budget from Egypt were no longer required and a much greater degree of financial autonomy was achieved.

In these first 14 years sound, steady but necessarily slow progress was made in building up the administration and obtaining the confidence of the Sudanese. On the economic front, the major effort was in seeking out and planning a project which would provide a major lift to the country's economy. The possibility of a major irrigation project in the Gezira district watered by gravity flow from a dam on the Blue Nile was recognised at an early date and confirmed by Sir William Garstin from the Egyptian Irrigation Department in the early years of the century. It remained to examine the viability of a cotton-growing irrigation scheme, bearing in mind Egypt's established rights in water from the Nile. Further problems lay in registering land tenure and conditions for the compulsory use of land for a major project: it was also necessary to decide how such a scheme would be managed. Finally, where was the money to come from to build the dam and the necessary ancillary works?

Each of these was a formidable problem in itself; the solution to questions concerning land and management required particular attention because they

could be seen as affecting the manner in which economic development throughout the country would take place. From the beginning, one of the government's main preoccupations was the welfare of the Sudanese and their advancement: there was also a desire to follow as far as was sensible and practicable the traditional methods of taxation, land tenure and cultivation.

In view of the experience of other projects, as well as the need for foreign capital to help establish the major scheme contemplated, it was agreed that all land should be registered. The government would lease the land from the owners, tenancies of 30 feddans would be created, one-third cultivated in cotton with dura and berseem in the remaining area. Landowners would have prior right to tenancies. The scheme would be managed by a foreign company, the Sudan Plantations Syndicate, which had obligations to finance the tenant's agricultural operations and to build the ginning factories, housing and other installations. The Syndicate's concession was to run for 14-years from the first crop, at the end of which compensation would be paid on an agreed basis by the government.

While the experimentation was going on, the British Cotton Growing Association became interested in the prospect of cotton growing in the Sudan because of some failures in the American and Egyptian crops and the limitations on expansion of cotton growing in Egypt. Sir William Mather, a Vice-President of the BCGA, took a personal interest in the Gezira project and kept himself informed with the progress of the Zeidab scheme. He persuaded the BCGA to resolve 'that the attention of His Majesty's Government should be drawn to the extreme importance of encouraging the further cultivation of cotton in the Anglo-Egyptian Sudan and to adopting some scheme on the lines suggested by the Right Hon. Sir William Mather'.

His Majesty's Government had hitherto regarded the financing of capital projects in the Sudan as the responsibility of Egypt and had rejected many requests from the Governor-general, Sir Reginald Wingate, to take an active financial part in the Sudan's development. Egypt had fulfilled the responsibility in the early years, but was less likely to accept an obligation to finance a scheme which would create competition with its own important crop. There is no doubt that the pressures brought by the BCGA, the British cotton industry, and the knowledge that the scheme would be managed initially by a British company of proven ability, were important factors in the case put forward by the Sudan government, which demonstrated the viability of the Gezira Scheme on the results in the experimental areas. His Majesty's Government was eventually persuaded in 1913 to guarantee the interest on a loan for £3 million to be raised in the London market.

Although some work was begun in 1913, World War I necessitated the postponement of the project and consequent reconsideration of its scope to ensure that enough water could be made available in the low period of the river

for the larger irrigated area required to make the Scheme viable in view of increased construction costs.

1914 to 1925

During the first eighteen months of the war measures of retrenchment were necessary to avoid a budget deficit, but in the years 1916-1918 the increased external demand for Sudan produce brought about not only an improved economy but also an increase in government revenue which helped to meet rising costs and to make larger contributions to general reserve funds. Indeed throughout the period 1914-1925, the government never incurred a budget deficit and the surpluses (amounting to over £E3,900,000) were transferred to reserves.

The policy of the government was to use the reserves prudently in furthering development, both social and economic, throughout the country. Townships with courts of justice, schools and hospitals grew where there were once small villages. Agriculture had been widely extended, the areas planted with cereals, leguminous and oil-producing plants, cotton, etc. amounting to about 2 million acres. The areas tapped for gum had also been greatly increased and vast herds of camels, cattle and sheep were owned by Sudanese. Slave trading had been stamped out and much land registered in the name of native owners: in pursuance of one of the government's principal objectives, namely, the welfare of the Sudanese, steps had been taken to prevent European exploitation. Education had been extended and considerable advances made in health care. Communications had been further extended throughout the country by making roads, bridges and wells and by the provision of extended postal and telegraphic facilities. Foreign trade had increased substantially with imports of approximately £E5 million and exports (excluding camels to Egypt) over £E2.75 million. Customs duties had increased to £E550,000.

In the last few years of this period, the final negotiations for the establishment of the Gezira Scheme took place. These were by no means straightforward, particularly because of Egypt's rights to the flow of the river when it was low. Sir Murdo Macdonald, the Irrigation Adviser to the Ministry of Public Works in Egypt, considered that a dam at Sennar rather than a diversion barrage was necessary. A Nile Projects Commission was set up in 1920 to consider how at each stage of development for storage water on the Nile the increase should be allocated between Egypt and the Sudan. Permission was, however, given to the Sudan to proceed with the Gezira Scheme on the understanding that the irrigated area should not exceed 300,000 feddans without Egyptian approval. An area of 300,000 feddans was calculated to give an income to the Sudan government in excess of its costs provided the price of cotton was 18 pence per pound weight and the yield three kantars per feddan (kpf). While accepting the

extension to 300,000 feddans, the Sudan government clearly had to keep in mind the possibility of an early further extension if the Scheme was to make a substantial contribution to the general development of the country.

The British government agreed that the amount of the loans to be raised under its guarantee on the London market could be increased to 13 million and work on the Sennar dam began in 1921. The dam and canalisation were completed on schedule in 1925 in time for cultivation in the 1925-1926 season.

It was fortunate for the Sudan that, throughout both periods dealt with, British advisers had strong influence in Egypt. They properly insisted on Egypt's financial supervision of the Sudan budget so long as Egypt was providing a subvention and on Egypt's approval of capital works in the Sudan for which loans were given. Such approvals were not unreasonably withheld. Similarly, their approach to Nile waters problems lay in securing fair allocations to both countries when more storage water became available, always provided that Egypt's established rights were not prejudiced. How much the Sudan relied on this unbiassed approach may be judged by the fact that a separate Sudan Irrigation Department was not established until 1921 when work on the Sennar dam began.

1926 to 1939

The first two years of the Gezira Scheme produced yields of 4.8 and 4.7 kpf and the financial results for all three partners were most encouraging. As these years had been unfortunate for the rest of the country because of inadequate rains, the value of the Scheme was clear to all, not only by showing the financial benefit to government in bad times, but also in producing food crops which could help relieve shortages elsewhere. At that time the Financial Secretary, Sir George Schuster, wrote, 'The essence of the matter is that the Gezira Scheme is an absolutely dominant factor in the whole Sudan position and until that scheme has been working on a large scale for several years it is impossible to say whether the Sudan is rich or poor'.

In November 1924 the murder in Cairo of Sir Lee Stack, Governor-general of the Sudan, and mutinies of Egyptian troops within the Sudan led to the deportation from the Sudan of all Egyptian troops and dissident Egyptians in government service. The ultimatum presented by the British High Commissioner to the Egyptian government following the murder also gave notice that the Sudan government would increase the area to be irrigated in the Gezira as the need arose. Following exchanges between the President of the Egyptian Council of Ministers and the High Commissioner in 1925 a Nile Commission was set up. The outcome was favourable to the Sudan in that new principles were introduced which related to a 'standard' rather than a 'worst' year basis with cover for the poor year by minimising the abstraction rate. This enabled

the Sudan to irrigate any area it wished to by economies in water usage both in the periods of surplus and of shortage. This allowed the Sudan government to consider further extension in the Gezira Scheme from 300,000 feddans to 450,000 feddans, that is, from 100,000 feddans of cotton to 150,000 feddans. Negotiations took place with the Sudan Plantations Syndicate and it was finally agreed that the extension should go forward provided, firstly, that the Syndicate reduced its percentage share of net profits progressively from 25 to 20 per cent when the full extension was completed, the government share increasing correspondingly from 35 to 40 per cent, and secondly that the Syndicate's concession should be extended from fourteen years to twenty-five years with options to the government to terminate the concession in 1939 or 1944 on agreed compensation terms.

This, of course, greatly strengthened the government's direct financial interest in the Scheme, not only by increasing its share of the net profits, but also by reducing its net costs per feddan. The extension was completed by July 1929, together with an additional 45,000 acres allocated to the Kassala Cotton Company, a subsidiary of the Sudan Plantations Syndicate in return for the government's taking over the Gash Delta scheme where friction between the Company and the local Hadendowa tribe had been growing. Indeed, by July 1929 the total irrigable area in the Gezira had been increased to 527,000 feddans. A further extension was completed by July 1931 when the figure became 682,000 feddans.

The government financed these extensions from its unallocated reserves with a further contribution from the Gezira Reserve and Equalisation Fund, to which it had prudently allocated all the surpluses over costs it had received in the early years of the Scheme. This was taking a considerable risk, the justification for which did not seem strong during the disastrous years to follow.

After the first two highly successful years of the scheme, yields dropped to 2.3 kpf in 1929-30 and to 1.4 in 1930-31. Worse, the world depression of the early 1930s struck the market and even the reduced cotton output was difficult to sell at the much lower prices of six to eight pence per pound. External trade which had been over £E13.5 million in 1929 dropped to £E5.5 million in 1931. Government revenue suffered not only from the indirect results from the fall in customs duties and railway revenue. The deficit on the 1931 budget was over £E1 million. Drastic retrenchment and deferment of approved projects elsewhere in the country meant that well-boring, new hospitals and medical expansion had to be deferred. Retrenchment of 20 per cent of government staff and of 40 per cent of the British officers in the Sudan Defence Force took place, salaries were reduced by 10 per cent and other amenities curtailed.

Intensive efforts were made to improve cotton yields (see below, chapter by Charles Smith). From 1931-1934 the tenants' share of the net profits had been negligible and they had not been able to repay the cultivation advances made

by the Syndicate. The solution to this problem was not easy to find: the government was itself under great pressure because of its deficits from the scheme while the burden on the Syndicate was heavy. It was agreed that government and Syndicate would pay equally into the tenants' cotton account loans to cover the tenants' debts. Eventually in 1937 a Tenants' Equalisation Fund was set up to which it was hoped contributions would be made in good years to repay the loans.

There was considerable improvement in the scheme from 1935 onwards with yields varying from 3.7 to 4.6 kpf, but prices remained low, varying from 5.9 to 8.6 pence per pound. This was only about 50 per cent of the price assumed when the Scheme began and the combination of yield and price, while giving the tenants profits, meant continuing government deficits which were accentuated by the reduction of 25 per cent in the cotton area when the four-course rotation was introduced.

At the end of 1939, the government's accumulated deficits from its direct interest in the Gezira Scheme amounted to over £E2,400,000. Nevertheless, government budget surpluses were achieved largely from indirect taxes resulting from the improvement in the country's economy. Resumption of many of the projects for social and economic development became possible while the government's own reserve position improved and cultivator reserves were established, not only in the Gezira, but also for the Gash and Nuba Mountains cotton areas.

1939 to 1955

During World War II men, material and other means of cooperation in the war effort became the first priority and general development was again forced into the background. Apart from assistance to the military effort, cooperation with neighbouring countries to increase the degree of self-sufficiency in the Middle East area was helpful and the volume of Sudan produce exported rose, as did their prices. A price stabilisation scheme was introduced which operated by skimming part of the increased profits from the exports and reducing the prices of essential import commodities. Consequently by the end of the war the degree of inflation was much lower than in many other countries: moreover, budget surpluses were achieved in each year. Had the Sudan had its own currency at the end of the war, a revaluation would have been justified. (See Appendix on Currency at the end of the paper.)

The government made three gifts of 100,000 each during the war, the first two to the British government in recognition of the services of the Royal Air Force to the Sudan before and during the War and to celebrate the recovery of Kassala, and the other to the Government of India in recognition of the part played by Indian troops in the freeing of the Sudan which had been in an

extremely vulnerable position when Italy entered the war. After the war ended, the British government gave 1 million to help support the Gordon Memorial College on its way to becoming a university in appreciation of the help given by the Sudan, military and otherwise.

Budget surpluses were achieved in each of the war years, but with a resumption of peace-time activities and further development it was clear that budget expenditure would rise. On the other hand, with wider opportunities for foreign trading, revenue would also increase so the prospects were favourable. During the war the United Kingdom Cotton Control, the sole wartime cotton purchaser, had eventually agreed to purchase the Sudan crops for the duration of the war and one year after, at a satisfactory price for the 1942 crop with increases in subsequent years to cover increased costs of production. This underwriting (when exporting to other countries was exceedingly difficult) was the means of securing reasonable returns for cotton tenants and of ensuring that the government would have surpluses from its interests in the Gezira Scheme. Yet it was not until 1945 that the government again reached a direct cumulative surplus from the Gezira, the first time since 1930. There was a reasonable certainty that cotton prices would increase after the war and no reason to expect that yields would be unsatisfactory because it seemed that the many difficulties concerning cotton growing had been overcome.

So it proved. Yields in the Gezira remained satisfactory in the period 1947 to 1950, but prices rose to 19.2 pence per pound in 1947 and to 41.3 pence per pound in 1950. The returns to all members of the partnership flourished as never before, though the government increased the export duty on cotton to build up funds for a faster rate of general development. In addition a Revenue Equalisation Fund was established, to be drawn on in years when budget deficits might arise. The general prosperity also led to increases in imports and import duty revenue.

For the first time the government was in a position to make forward plans for the general development of the country: a plan anticipating expenditure of £E14.5 million over the years 1946-1951 was approved. Subsequently with continuing prosperity an even more ambitious development plan of £E34 million was approved for the period 1951-1956. This plan was, of course, strongly assisted by the termination of the Sudan Plantations Syndicate concession in 1950 and the assumption by the government of the Syndicate's share of profits. The expansion of the education, medical, veterinary, agricultural and other departments, together with local government, included in these development plans, created larger expenditures in future years within the annual budget. They were to some extent offset by revenue from the new productive projects included in the plans. In 1953-54 the ordinary budget was

balanced at £E28.5 million with a surplus of £E1.7 million - in fact, a surplus of £E4 million resulted - compared with a budget of approximately £E9.2 million in 1947-48.

The budget presented for 1954-55 by the first Sudanese Minister of Finance followed the policies which had been successful in the preceding years. The budget figures were little changed from those of the previous year, but the Minister's speech introducing the budget to the House gave indications of the changes his government would be introducing in due course.

For the years 1955-56, budget revenue and expenditure were £E35.8 million and £E34.2 million respectively, with a surplus of £E1.6 million. It was considered that, as notice of Sudanisation had been received, a detailed memorandum should be prepared in an attempt to show what the prospects might be for a few years ahead. (A copy of this memorandum has been placed in the Durham Sudan Archive.) In the event, the notice was withdrawn just before the final date by which all foreigners in positions of influence had to be out of the country. Information was given privately by the Prime Minister that the notice had been withdrawn because there was no longer any intention of proceeding to unity with Egypt. The estimates given in some detail in the memorandum may be summarised as follows:-

	£E millions					
	1955/56	1956/57	1957/58	1958/59	1959/60	1960/61
Budget surplus	3.3	5.0	5.0	5.0	5.0	5.0
New sources of revenue	.5	1.1	1.3	2.2	2.9	4.2
	3.8	6.1	6.3	7.2	7.9	9.2
New items of expenditure (a)	.9	2.0	2.9	3.8	4.9	5.8
Estimated budget surplus	2.9	4.1	3.4	3.4	3.0	3.4
Development requirements (b)	1.4	8.0	12.2	15.2	15.2	15.2
Deficiency	-1.5	3.9	8.8	9.8	12.2	11.8

(a) assumes no further expansion of the SDF.

(b) the largest item is the Roseires dam although Education and Health are well provided for. The final phase of the Managil Extension is also included.

The object of the memorandum was to demonstrate that, with optimistic rather than pessimistic assumptions, the desire to proceed with development quickly could not be realized without financial aid from foreign sources, coupled probably with some cutback in the expansion of social services and defence. It followed that the introduction of a Sudanese currency was urgently required so

that approach could be made to the International Bank for Reconstruction and Development and other international agencies for financial support for the major productive development projects.

£E millions					
Revenue			Expenditure		
Agriculture and Forests	2.38	(2.39)	Provinces	3.64	(3.01)
Posts and Telegraphs	1.62	(1.37)	Post and Telegraphs	1.45	(1.27)
Customs & Sugar Monopoly	22.84	(18.69)	Agriculture & Forests	3.24	(3.39)
Irrigation and Hydroelectricity	9.25	(5.21)	Education	5.68	(3.91)
Gezira Cotton	3.71	(3.62)	Health	2.79	(2.61)
			Public Works	4.05	(3.94)
			Irrigation & Hydroelectricity	1.74	(1.74)
			Defence	4.00	(2.72)
			G.C.S.	3.72	(4.91)

The budget for 1957-58 showed revenue at £E45.6 million with a surplus of £E5.2 million which was better than the figure of £E3.4 million anticipated in the last paragraph. By this time, approaches had also been made to the International Bank.

It may be of interest to note the principal items of revenue and expenditure in the 1957-58 budget. The corresponding figures for 1955-56 are shown in brackets: these were much the same as those for 1954-55.

When independence was obtained at the end of 1955, the country's foreign reserves were £32 million, of which over 80 per cent was deliberately held in currencies other than Egyptian; the government's own liquid funds were over £28 millions. A high percentage of the latter figure was earmarked for the completion of the development plans.

It can be said that, when the British and Egyptian flags were lowered for the last time in January 1956 and the Sudanese flag raised in their stead, the financial and economic position of the country was satisfactory with good reserves, a substantial development plan in train and a further major plan under examination. This was confirmed by the International Bank for Reconstruction and Development which came to the country to examine its creditworthiness before deciding to give financial support to the Roseires dam.

It was to be hoped that the rapid Sudanisation which had taken place would not impair the increased rate of development made possible by the

exceptionally prosperous years in the early 1950s. It did seem that Sudanese civil servants were responding well to the new challenges facing them, but they too had difficulties under some of the Ministers who had had little appropriate experience.

NOTE: See also below Sir John Carmichael's paper 'The period of self-government 1954-55 and the early years of independence 1956-59'.

APPENDIX: A NOTE ON CURRENCY

Throughout the period of the Condominium, the Sudan used Egyptian currency, both notes and coinage. It would have been impolitic to suggest that an independent or other currency be substituted because, although Egypt's interest had been reduced from complete sovereignty to partnership in the Condominium, Egypt had not relinquished hope that sovereignty might be resumed at a later date. Moreover, in return for Egyptian support Egypt was given the right of supervision of both the Sudan government budget and its capital works programmes.

Once the Sudan government had begun to balance its budget and had arranged to finance further capital works by loans on the London market, it obtained financial autonomy and was no longer subject to close Egyptian financial supervision. However, it appears no attempt was made to introduce a Sudanese currency, presumably because relations between the UK and Egypt had deteriorated and Egypt had renewed claims for sovereignty over the Sudan.

The disadvantages of a government's not having its own currency are formidable. To secure full independence in regard to its economic policy, a country must have full control over its currency, banking, credit and foreign exchange. While using Egyptian currency, the Sudan had not the means to control adequately any of these items.

In the early days of the Condominium, the disadvantages of not having an independent currency were not apparent because the situation in the country was so chaotic that it necessitated subsidies and these were made available. Even after the Sudan managed to balance its budgets, its financial status was such that it could not have raised funds from abroad unless the British government had given guarantees for the loans on the London market. These, together with the debt to Egypt, amounted to some 23 million, leaving inadequate the security for further foreign loans.

After World War II the situation changed for the better. The success of the Gezira Scheme allowed the government to establish much increased budget surpluses and so it could embark within its own resources on more ambitious development plans. The security for further foreign loans had also improved, but foreign funds available to Third World countries were not available to the Sudan which, lacking its own currency, could not join the International

Monetary Fund and the International Bank for Reconstruction and Development. It was at this stage that the disadvantage of not having an independent currency was really felt because some limitation on the rate of economic expansion resulted. In particular, the construction of a dam at the Damazin gorge near Roseires had to be deferred. Such a project would have been well justified (as it was later) because of the established success of the Gezira Scheme and by the much more prosperous state of the country's economy.

In the absence of a central bank controlling the country's currency, it was within the powers of the Finance Department to put some limitation on the issue of credit by the commercial banks. Such powers were not used because these banks were assisting the economy by making advances to Sudanese private enterprise. The large expansion in the acreage of pump schemes under Sudanese ownership referred to in Mr Matthews's paper would not have been possible without such assistance. As the level of these bank loans and advances exceeded local deposits, funds to meet the difference must have been obtained from the headquarters of the commercial banks abroad. This arrangement in which the government carried no risk was not unhelpful at a time when development funds were short.

The inability of the government to control the exchange rate of currency used, while recognised as a disadvantage, did not cause concern until Egypt or the UK changed the exchange rate for the Egyptian pound or sterling respectively. As Egypt was in the sterling area, normally the rate of the Egyptian pound followed a change in the rate of sterling. In 1949, when the UK devalued the pound, there was initial hesitation in Egypt as to whether it should follow. The Sudan, having no say in the matter, had no option but to declare the local commercial bank closed. When news came through that the Egyptian pound had followed sterling, the Sudan immediately introduced changes in the customs duties on both import and export duties in an endeavour to minimise the effect of the devaluation of the currency in use because its foreign trading had been on an entirely satisfactory basis before the devaluation. In this way, some measure of balance was achieved between the interests of those who would benefit from the automatic increase in export prices and those who did not. This device, of course, could be no more than a palliative but served notice of the practical disadvantage of not being able to determine when to devalue or revalue the currency in use in the best interests of the country's economy.

The amount of currency in circulation in the country was also not under the control of government. This was regulated by the net flow of notes from the National Bank of Egypt, Cairo, to its Khartoum branch. Any increase in the circulation by the issue of notes to customers in the Sudan had to be paid for by value in kind. So the Sudan as a whole had given value to Egypt over the years of the total amount of currency in circulation: in other words, the Sudan had

given Egypt a free loan of the amount of Egyptian currency in circulation in the Sudan less the comparatively low cost of printing the notes. This loan, of course, earned interest in the hands of the National Bank of Egypt, being the Central Bank of Egypt, but the Sudan received only a nominal share of this interest throughout. As the circulation in Sudan must have increased progressively to £E16 to 20 million by the end of the Condominium, the interest foregone was considerable and certainly an adequate counterbalance for the interest-free loans from Egypt for capital works in the early years amounting to £E5,415,000.

By using Egyptian currency, the Sudan could not control its foreign exchange earnings. The proceeds of its exports had to be converted from the currency of origin to Egyptian pounds, and likewise imports had to be paid for by converting Egyptian pounds into the appropriate foreign currency. Over the years it was subsequently proved that earnings of foreign currencies appreciably exceeded payments in foreign currencies and this excess was inevitably included in Egypt's holdings of foreign exchange. In the event, this did not impede the receipt of money within the Sudan for exports nor the payments for imports within the Sudan but Egypt did have the power to withdraw or restrict such conversions at any time.

In 1951 the Executive Council, of whom 50 per cent were Sudanese, decided that the Sudan should at least take preparatory steps for the introduction of a Sudanese currency. Accordingly, plates for the printing of Sudanese notes and a stock of security notepaper were made ready. It became evident that with the imminence of political change with countrywide elections, the matter could not be taken further, but that, whatever political persuasion came into power, it should be recommended that a Sudanese currency be introduced.

THE PERIOD OF SELF-GOVERNMENT 1954-55 AND THE EARLY YEARS OF INDEPENDENCE 1956-1959

Sir John Carmichael

The introduction of self-government at the beginning of 1954 was bound to create a very different atmosphere for all members of the civil service whatever their nationality. For foreign civil servants, there was to be statutory Sudanisation of the Political Service within eighteen months and of all others whose posts might allow them to bring influence to bear at the time of self-determination. For Sudanese, there was the expectation of rapid promotion within what was the Political Service but became the Ministry of the Interior - and the envy of those in all other departments or ministries where such expectations were not so assured.

There were other major clouds on the horizon:

1. The party which came into power at the self-government elections - the National Unionist Party (NUP) - had boycotted the Legislative Assembly and so had no experience of parliamentary government or of Cabinet responsibility. Further, very few had experience of positions of authority within the civil service. This created problems not only for the foreign but also for the Sudanese civil servants.
2. The certainty and uncertainty of Sudanisation for foreign civil servants was aggravated by the fact that terms of compensation on Sudanisation had not been specified in the 1953 Anglo-Egyptian Agreement for Sudan self-government and self-determination. This adverse situation was unique among all similar transfers of power.
3. The NUP was elected on a platform of unity with Egypt and it is not an overstatement to say it was anti-British.
4. The recent recruitment of a number of Assistant District Commissioners direct from British universities on twenty-year contracts subject to substantial compensation in the event of premature

termination of contract was greatly resented by the Sudanese, particularly in view of the policy expressed in 1947 of accelerating Sudanisation.

5. Arthur Gaitskell's successor as Chairman and Managing Director of the Gezira Board, appointed by the Secretaries but opposed at the time by British and Sudanese members of the Board, turned out to be a quisling who took every opportunity to decry British efforts in the Sudan. In this, he was supported by a British civil servant seconded from the Treasury to assist with the introduction of a tax on income.

6. The first Sudanese Minister of Finance and Economics had been dismissed for subversive activities six years before. He had suffered cerebral malaria which had not improved his capacity, had no love for the British, and was suspicious of any advice given.

7. The advent of diplomatic representation in Khartoum, where many foreign countries established relations with the Sudan, was an innovation. Finance was offered for ill-considered projects at a time when the civil service, to be weakened by rapid Sudanisation, was attempting to cope with the most ambitious government development plan there had ever been.

8. The Sudan had used Egyptian currency since late in the nineteenth century. During the Anglo-Egyptian Condominium it was not possible to remedy this anomaly because of Egyptian influence. Nevertheless, the Executive Council, not long before the 1953 Anglo-Egyptian Treaty for self-determination, agreed steps should be taken to prepare for the introduction of a Sudan currency. Subsequently dies were made for various denominations of notes. Approved specimen notes were provided, care having been taken that none of the scenes on the notes had political interpretations. Printing of the notes was not proceeded with since such a decision would have to be made by an all-Sudanese government.

When the first Sudanese government came into power, the first priority appeared to be to get on with Sudanisation as quickly as possible. It soon became clear that extensive Sudanisation of all ministries was going to take place within the stipulated time. From the general civil service point of view, the first priority was to try to establish proper relations between ministers and civil servants so that the work of government could continue as smoothly as possible.

Just before the NUP took office, a meeting of the heads of all departments was called at which it was explained what the relationship should be once ministers took office. In brief, this was that the senior civil servant of a ministry had a duty to advise his minister, the minister would take the decisions having received the advice, and the senior civil servant was responsible for seeing that these decisions were efficiently carried out whether or not his advice had been taken.

Once the NUP was in power, a meeting of some of the civil servant heads was sought with the Prime Minister through the Minister of Finance to consider a memorandum already presented which incorporated in some detail the principles set out in the previous paragraph and pledging the support of civil servants in carrying out the decisions taken by ministers. The submission was viewed with some suspicion and evidence in support was requested. This was provided by presenting Dale's book on the British civil service and the 1932 Report of the Committee on Ministers' Powers to the British government.¹ In the end, the memorandum (with minor amendments) was circulated by the Cabinet to all ministers and civil service heads of ministries. This, at least, provided a base for reference when incorrect procedures were pursued, as indeed they were on frequent occasions. Subsequently, it was also necessary to bring to the notice of the Minister of Finance that no minister had authority to make definite public statements of policies or decisions which involved expenditure unless there had been approval through the normal financial channels. Both the Minister of Finance and the Prime Minister accepted that unless such a procedure were followed the government would be publicly embarrassed, but some other ministers did not like the restriction.

The Sudanese Sudanisation Committee soon came to the conclusion that all but a few technical posts occupied by foreigners should be Sudanised within the statutory 18-month period, and the disarray within the departments was considerable and worrying.² But much the most difficult aspect of Sudanisation was to obtain approval for a scheme for compensation to foreign individuals who were Sudanised. This had to take place when ministers were shying away from finalising the budgets, and eventually led to budget meetings from 8.00 p.m. to midnight during Ramadan. Nevertheless, a scheme was prepared and discussed with the Expatriate Civil Servants Committee. The scheme took into consideration what had happened in Egypt, India and in other countries. Indeed, it did not exceed the schemes in these countries, although those had been approved some years before. Having regard to the different circumstances, it was considered fair. The Expatriates Committee not only found it inadequate but put pressure on the Governor-general to give them assurances. It was only to be expected that the scheme would find disfavour with the Council of Ministers who decided to ask India, Egypt and the United Kingdom to send experts to consider the scheme. The consensus of their

opinions was, as might be expected, for a slightly lower scheme. When the British expert was challenged to say why he had omitted a relevant factor in his calculations, he admitted the mistake but was not prepared to correct it. This was a time when it was difficult to feel that one was pleasing anybody, and, with the intense amount of other extra work involved by the new circumstances, I was forced to take early leave on doctor's orders. John Rinton, my deputy, kindly deferred his leave to cover. The Governor-general, Sir Robert Howe, John Rinton and Bill Luce took the matter on and eventually the Governor-general, to his great credit, got the full scheme approved with some begrudged assistance from HMG whose lack of interest in this matter, despite many appeals, had been deplorable, bearing in mind that they had been party to the Agreement which had created the situation, had made no attempt to solve it in the Agreement, and had washed their hands of it thereafter.

Once Sudanisation had been virtually completed, it remained to be seen how the Sudanese civil servants would face up to the challenge of much greater responsibility under ministers who were inclined to make scapegoats of civil servants when it was necessary to do so to save themselves from public embarrassment. It was fortunate that the civil service had many Sudanese with full Western qualifications followed by some years of experience in the country, and so there was hope. Yet victimisation threatened not only British but also Sudanese civil servants.

Apart from these extraordinary burdens, it was distressing to have to wait long periods of time before the Minister of Finance would give decisions on advice given. This was due not only to inexperience but also to suspicion and enmity. Having protested at the delays without avail, I requested that I should go with the Minister to see the Prime Minister. At that meeting, I explained that because of the delays in decision by my Minister, the work in the ministry was being delayed to the detriment of the country's interest. As this appeared to arise from suspicion that my advice was not unbiased, I requested that the Sudan government should ask India to send a delegation to consider whether I was giving proper advice or not. When reluctance was shown I said there was no point in my staying if suspicion was not removed. In due course, a high powered two-man Indian delegation came. They found no fault in the advice I had been giving and strongly confirmed the need of the Sudan to have its own currency. At the same time, I suggested to the Prime Minister that he and his Cabinet might prefer to have an Indian adviser who could take over from me when appropriate. After discussion this was agreed and, in due course, Naharawi Rav, aged 64, came and stayed in the house next to mine. From the beginning he disliked the country and the job and departed within nine months having made no impact on the Sudanese whatsoever. So as far as the Sudanese

Cabinet was concerned it had become a case of sticking to the devil you know! The recommendation by the Indian delegation for a Sudan currency was, of course, gratifying.

I was given due notice of Sudanisation and told to be out of the country before the deadline on 30 June 1955. This notice was revoked only four days before we were due to move out of our house and when all the belongings we wished to take home had been crated and sent to Port Sudan. When I said to the Prime Minister and the Minister of Finance that this was contrary to the 1953 Anglo-Egyptian Agreement, the Prime Minister said to me in confidence that there was now no question of union with Egypt so they were not concerned about the breach caused by keeping me on. I could not refuse the request and, as it was the first acknowledgement that the government considered my services useful, it was gratifying, albeit disturbing to our domestic affairs. I did request, however, that I should become an Adviser and be relieved of the post of Permanent Under-Secretary and Head of the Civil Service.

Early in December 1955, Sayed Siddibi El Mahdi called at our house one evening to ask me to advise the Governor-general that if the latter went on leave over the Christmas period, as was his intention, the NUP would unilaterally declare independence. I called on the Governor-General to convey the message but he was quite adamant in going to the United Kingdom, saying that independence was due shortly anyway and little would be lost if it did come about by unilateral declaration, particularly while the NUP were in power. And so it happened: the official end of the Condominium was declared on 1 January 1956 when the Sudanese flag was raised while the Union Jack and the Egyptian flag were lowered.

Shortly after Independence the NUP split, one part - the People's Democratic Party - uniting with the Umma Party. Elections were held early in 1956. The NUP were defeated and the United Party came into power under Sayed Abdulla Khalil as Prime Minister, with Sayed Ibrahim Ahmed, the Minister of Finance. These were old friends, having participated to the full in the Legislative Assembly and the Executive Council prior to self-determination. Shortly thereafter, the Cabinet put a motion before Parliament for the introduction of a Sudanese currency and this was approved.

The start of negotiations with Britain and Egypt for the redemption of Egyptian notes and coins was, however, held up by the Suez crisis. Suez was a great shock to the Sudanese and to the British still in the Sudan. They could not understand why Britain should invade Egypt on the side of Israel when the economic relations with the Muslim countries were so much stronger and indeed when political relations were not unfriendly. The Sudanese government did not go so far as to ask the British Ambassador to leave, but it boycotted the Embassy. After a few days, I was asked by the Sudan government to be a runner between it and the Embassy on a few matters which did not brook delay.

The British Ambassador felt obliged to make plans for security and evacuation to be used in the event of the situation getting uglier and, with the approval of my minister, I served on the committee set up for that purpose. Earlier it had been a shock to realize that the Embassy was not aware of the Suez landing until my wife, having heard the news on the radio, rang up. The situation generally was so unpleasing that I sent a memorandum through the Embassy to the Foreign Minister, Selwyn Lloyd.³ In due course, I was advised by the Ambassador that he had a letter for me from Selwyn Lloyd and would I call. When I met the Ambassador, he told me that after I had read the letter it had to be burnt. The letter was defensive and gave little satisfaction; it was duly burnt.

In due course, negotiations with the Egyptian and British governments took place concerning the introduction of a Sudanese currency. (In the negotiations with Egypt, Egypt refused to allow me to sit at the table but, by direction of the Sudan Finance Minister, I was conveniently close.) It was suggested to the Egyptian government that as its sterling balances were blocked, it would probably be willing to support a Sudan claim to the British government for the release of the appropriate amount of sterling when Egyptian currency was returned to Egypt. This was agreed. The British government was pleased to cooperate although the Sudan government was reasonably obliged to take a comparatively small amount of Egyptian securities to make up the balance of the Egyptian currency returned. It was not difficult to demonstrate that the Sudan had earned far more in foreign exchange than the amount of currency in circulation particularly when it was realised that all military expenditure in the Sudan before, during and after the Eritrean campaign had been paid in sterling to Egypt.

The Suez affair affected the Sudan in another way. Liverpool stopped buying cotton from Egypt, and the Gezira Board thought it could establish high prices in the belief that Liverpool had no alternative source of long-staple cotton. In the event, Liverpool got along with the longest-staple American and Peruvian types, and there were virtually no sales of Sudan cotton. In a time of rapid development the need for the availability of foreign reserves is paramount and the government became concerned, yet they were unwilling to override those Sudanese in control of marketing Gezira cotton. Eventually, the Prime Minister, Sayed Abdullah Khalil, decided to go to London for medical treatment. When he arrived I was summoned to London from leave in Scotland to attend a meeting with the Board of Trade. The meeting, while cordial, had no solution, but gave confirmation that Liverpool could get along without Sudanese long-staple cotton at the price prevailing. The next meeting was a lunch at 10 Downing Street. Macmillan asked Eccles to report on the meeting at the Board of Trade. Eccles pulled out a piece of a paper and explained this was a draft *communique* which, subject to Sayed Abdulla's approval, would be

released to the Press. The gist of the *communique* was to the effect that the meeting had agreed that the Sudan minimum prices were too high. Sayed Abdulla was in difficulty and I whispered to Selwyn Lloyd that Sayed Abdulla would not be able to accept the draft. Selwyn Lloyd then suggested to Macmillan I should speak. I asked the British Prime Minister to put himself in the shoes of Sayed Abdulla who was in the UK for medical treatment. Would he consider such a press *communique* acceptable on his return to his own country? Macmillan lent forward, looked along to Eccles, said not a word, but Eccles quickly put the draft back in his pocket. After lunch I was summoned together with the two-man Liverpool representation to discuss the matter with the two Prime Ministers. It was agreed I should go to Liverpool to see whether something could be worked out. Eventually, agreement was reached that Liverpool would undertake to buy 200,000 bales were purchased by Liverpool within the next two weeks. The auction prices even rose above the new minimum prices. I was surprised to receive a letter of congratulations from Eccles.

Applications to join the International Monetary Fund and receive aid from the International Bank of Reconstruction and Development were made once the Sudan currency had been introduced. This required a detailed memorandum to establish the Sudan's credit-worthiness. The international banks were satisfied. There followed the preparation for the case for a loan to assist the construction of a dam at the Damazin Gorge near Roseires and some ancillary productive works from the additional waters provided. Approval was forthcoming for the dam itself but not for any of the ancillary projects. When enquiry was made why this was so since the repayment on the loan depended on new revenue to be created, the answer given was that while the Bank was entirely satisfied with the present credit-worthiness of the country's finances, it wished to see how the country progressed under independence before it was prepared to commit itself further.

A further most important exercise took place in the years immediately following independence - a new agreement with Egypt over the distribution of Nile Waters. Humphrey Morrice, who had been kept on as Irrigation Adviser, did most of the heavy work for this vital problem, with Finance contributing its piece on the economic aspects. The negotiations were tough, but an outcome satisfactory to both sides was reached.

Sayed Ibrahim Ahmed asked me to stay until 1968 by which time it was clear that the Sudanese civil servants felt they had enough experience. Just before our departure Sayed Abdulla Bey Habl, Ibrahim Ahmed and the Cabinet gave us a grand dinner attended by all the Diplomatic Corps with a musical background provided by an Army Pipe Band specially brought to Khartoum from El Obeid. It was unexpected but most gratifying to have this public acknowledgement of one's services to the Sudan.

Not long after, the Army took over with the consent, it was believed, of the government. Problems were certainly arising with poorer cotton prospects and prices, difficulties in the Private Estate Schemes, and the atmosphere was increasingly depressing. The Army decided after a short time that they had to have civilian ministers in certain of the ministries while preserving ultimate power in an Army Council. Sayed Abdul Majid Ahmed was appointed Minister of Finance and he wrote to me asking me to go out again to advise. As he was an old friend, I felt an obligation to go out for a trial period and discuss the matter with him. It was very clear that he had little authority and indeed the Army Council had begun to regard him with disfavour to the point that they might ask him to resign. I could not see how I could be of much help to him or the country in the circumstances, quite apart from the fact that my return would not be popular with some of the senior ministry civil servants. I discussed the matter fully with Sayed Abdul Majid and reluctantly told him that I thought it was time for me to go finally, although I said I would send him a full up-to-date review of how I saw the financial and economic situation on the basis of the figures that I had made available to me. I also offered to go out to the Sudan in future if he wished to have advice on any specific problems. Thus ended a period of service of 23 years in the Sudan on which I shall always look back with great pleasure and happy memories.

Notes

1. Dale, H.E., *Higher Civil Service in Great Britain*, Oxford, 1941.
2. For further details of the situation within the Ministry of Finance and Economics see Durham Sudan Archive.
3. A copy of the memorandum is deposited in the Durham Sudan Archive.

IRRIGATION DEVELOPMENT IN THE SUDAN, 1898-1955

I.S.G. Matthews

Introduction

So far as the need for irrigation is concerned the Sudan can be divided into three regions. In the northern Sudan, from the Egyptian boundary to approximately the latitude of Shendi, the rainfall is less than 100mm per annum. The central region is defined by the 500 mm *isohyet*, which is approximately on latitude 13 degrees north, and runs through Singa/Renk/Abu Zabad/Nyala. In the northern region, crops can only be secured on lands which are irrigated or naturally flooded by rivers. In the central region, in years of average to good rainfall, rain crops can be grown with a fair degree of certainty south of the 300mm *isohyet*, (approximately latitude 15 degrees north), while north of this line crops can be only grown in years of good rainfall. In any event, due to the short rainy season from June to September, cultivation is restricted to varieties of millet and other quick maturing crops. In the third region, further south, the rainfall ranges from 500 mm to over 1200 mm which suffices for all cultivation, although from time to time a season of comparative drought seriously affects crop areas and yields.

It is fortunate that the alluvial plains in the central region provide extensive areas of black cotton soil, and are suitable for irrigation both as to soil characteristics and topography. The basins of the Blue Nile, Rahad and Atbara rivers all contain areas suitable for irrigation. On the White Nile, south of Khartoum, there are also smaller pockets of land available for development, and the same applies to the Main Nile from Khartoum to the Fifth Cataract north of Atbara, and from Merowe to Argo, north of Dongola. Although the total average annual flow of the Nile exceeds 80 milliards M^3 , irrigation development in the Sudan has always been controlled, if not inhibited, by the accepted principle that established users have priority, and therefore the vast irrigated areas already existing in Egypt had to be assured of adequate supplies before water was extracted from the rivers for use in the Sudan.

Various types of irrigation were practiced in the Sudan.

- a) The earliest system was basin irrigation where, during the Nile flood, water is poured into a depression. The water may or may not be controlled by bunds and simple regulators, and thus passed from basin to basin and returned to the river.

- b) Flush irrigation is a development from natural flooding. The water is distributed by a simple canal system and the land given a single soaking during the season of high flood.
- c) Gravity irrigation by free flow from the river, where headworks have been constructed to control supplies. This is associated with a fully reticulated canal system delivering water to the individual farm holdings.
- d) Pumped irrigation, where water is provided to the canal system by pumps from the river.
- e) Traditional systems where the water is raised by *saqiya* or *shaduf*. This was mainly on the Nile and its tributaries and is essentially a form of local development, outside the scope of this note.

The Sudan Irrigation Department was set up in 1921. Prior to this date the Egyptian Irrigation Service was responsible for all operations in the Sudan. The Egyptian Irrigation Service was largely concerned with planning and survey work, which included the hydrological survey of the Nile Basin, and preliminary works and designs for the Gezira Scheme. In addition, the Northern Province basins were developed and a start made on the construction of the Sennar dam and Gezira Scheme. After 1921, the Sudan Irrigation Department took over all irrigation development in the Sudan. The Egyptian Irrigation Service continued the hydrological survey and planning of conservation works throughout the whole of the Nile Basin. There was close collaboration between the two services on all matters concerning Nile waters.

Basin irrigation

In the Sudan, the Nile valley is not subject to annual flooding as in Egypt and conditions suitable for basin irrigation only exist where chance depressions are found. These all occur in the Northern Province, between Sabaloka Gorge and Atbara in the Shendi reach and from Merowe in Kerma in the Dongola reach. In 1905 the Kerma plain in the Dongola reach was discovered and development started on the basin lines in 1909. Extensive surveys were carried out in the Dongola province from 1907 onwards and a number of small basins opened. During World War I, the need for food crops spurred on agricultural development. Three of the Dongola basins were converted to pump irrigation. At the same time the Shendi reach was surveyed and there the basins really date from about 1917.

The development and technical operation of the basins was undertaken by the Egyptian Irrigation Service. In the Dongola reach nearly 90,000 feddans were commandeered, made up of Kerma (70,000 feddans), Letti (70,000

feddans) and Argo (65,000 feddans) with a further seven small basins (4,200 feddans) in the vicinity of Debba. In the Shendi reach, there were eleven basins ranging from 600 to 8,000 feddans, totalling about 40,000 feddans.

The success of basin irrigation depends on the flood, and the flood must hold river levels long enough to cover the period of filling. In the Dongola area the range was from 5,000 feddans on a bad flood to 70,000 feddans on a very good flood, with an expectation of about 40,000 to 50,000 feddans. The corresponding figures for the Shendi reach were between 6,000 feddans and 41,000 feddans with an expectation of 30,000 feddans.

In the Shendi area about 80 per cent of the flooded area was cultivated with millet or chickpea. In the Dongola reach, the proportion of cultivated area was much smaller, generally no more than 10 per cent. In the early years Kerma basin produced magnificent crops, but the promising areas rapidly ceased to yield. Although the basins occupied a position of considerable importance in the economics of the Northern Province, they were of very doubtful agricultural value. Even in the Shendi area, due to the wide variation in the extent of the annual flooding it was found impossible to establish any permanent system of agriculture. The probability of a good year was at best one in three, and for bad years, one in two. The expectation for the Dongola reach was certainly no better than this, which confirms the unpredictability of settled agriculture.

The only way to overcome the dependence on flood levels would have been to control them artificially by construction of weirs or barrages across the Nile. This was evidently not a feasible proposition. The practical solution was to convert to pumped irrigation where the soils and topography were suitable, a process which proceeded spasmodically and slowly from 1917 onwards. In spite of the disappointing performance the basins served some purpose in a region devoid of rainfall. The failure to make some useful development in the Kerma basin would appear to be a major omission, in an area in dire need of settled agriculture, and where a large scale project of 70,000 feddans would have been invaluable.

The Gash Scheme

Flush irrigation was practised in Kassala Province in Gash and Tokar deltas. The Khor Baraka flooded the Tokar delta, and was left to do so without canalisation or control works, or any irrigation input. On the other hand, the Gash flood was controlled and distributed through a canal system.

The apex of the Gash delta is at Kassala and it extends northwards and westwards for more than 100 kilometres. The surveyed area exceeded 750,000 feddans. The River Gash usually flows from early July to late September. The discharge is torrential and highly variable. It may increase from a mere trickle to $800 \text{ m}^3/\text{sec}$ within a day or even a few hours. Discharges were measured at

Magouda, about 40 km downstream of Kassala, giving an average discharge over the period 1923-1940 of 403 million m^3 , and ranging from 90 to 965 million m^3 .

There are large stretches of *lebbad* soils having a high silt content (up to 40 per cent) and good water-retaining qualities, penetration exceeding four metres (against 1.5 metres for Gezira clays). In the north of the delta, the *badob* or cracking clay soils occur with lower permeability and retention. The optimum watering period for *lebbad* soils was found to be 10 to 12 days and for *badob* from 25 to 30 days.

The even topography and natural slope from east to west and north to south provides an extensive plain which is ideal for a gravity irrigation supply.

In 1923 a concession was granted to the Kassala Cotton Company which took over the agricultural management of the delta in the 1924-1925 season. This arrangement lasted for only three seasons until 1927 when the Company transferred to the Gezira Scheme. During their short tenure the Kassala Cotton Company made substantial progress on construction of five branch canals from the Eastern Gash Ghor and the distributary canals. The Gash Board, a semi-autonomous government authority, took over management of the project in 1927 and continued extension of the canalised area, including the northern extension which was completed in 1936. The area served is somewhat nebulous but was of the order of 200,000 feddans. The canal system was very simple. The Eastern Gash was used as the main supply channel with earth bunds to confine its movement. Seven branch canals took water from the Gash, through masonry head regulators, controlled by steel girders used as 'stop logs', to supply distributary canals or *misqas* which served from 500 to 5,000 feddans. Initially pipe regulators were installed as head regulators; these were later converted to masonry weirs. The *misqas* debouched on to the fields where the flood water was confined by intercanal banks which stopped the water flooding adjacent fallow land. In addition river works were constructed upstream of Kassala Town to prevent dispersal of the Gash and confine it to the Eastern Ghor and also to provide town protection works.

The Gash Board operated the scheme on behalf of the Sudan government, with experienced agricultural and irrigation staff seconded from the technical departments. The area was demarcated into 10-feddan plots and holdings issued to tenants each season, the size of the farms varying from five to 50 feddans depending on the competence of the farmer.

Each year one-third of the land was scheduled for irrigation to allow two years fallow after the cotton crop. A figure of 6,000 m^3 per feddan was adopted for irrigation requirements, which meant that an average flood of 400 million m^3 should irrigate about 50,000 feddans, as it was not possible to divert the

whole of the river discharge. In practice, the objective was to plant up to about 35,000 feddans of cotton each year, the remainder of the flooded areas being used for dura or grazing.

The highest recorded area flooded (up to 1941) was about 85,000 feddans. The results of a five-year period from about 1935 to 1940 give an average effective cotton area of about 31,000 feddans producing 61,500 large kantars of seed cotton (315 pounds) or about two kantars per feddan (kpf). The proceeds of the cotton crop were shared between tenants (50 per cent), Gash Board (30 per cent) and central government (20 per cent). There were about 6,500 tenants who also enjoyed the full benefits from the sorghum and grazing on the fringe flooded areas.

The Gash Scheme provided an excellent example of controlled flush irrigation making use of an erratic and seasonal torrent to flood from 40 to 60,000 feddans each year. Although yields were lower than those obtained from systematic irrigation, the canalisation is simple and its construction economical. The question might be asked as to why the comparatively low objective of 35,000 feddans of cotton each year was adopted. It is probable that shortage of labour was a limiting factor and the Gash Board opted for an area which could be cultivated and the crops harvested with some certainty.

Irrigation by pumps

The Egyptian Irrigation Service engineers who were responsible for irrigation development in the Sudan until 1921 jealously guarded Egypt's water resources. In 1905 open permission was given for pumped irrigation between 15 July and 28 February, outside the 'timely' period, when Egyptian requirements exceeded supplies. Perennial irrigation was limited to 22,500 feddans. In 1925 the Nile Commission issued the terms which were later embodied in the 1929 Nile Waters Agreement, by which the Sudan might divert water by pump irrigation from 15 July to 31 December without limitation, from 1 January to 28 February for 38,500 feddans, and from 1 March to 15 July for 22,500 feddans. Any withdrawal in excess was reserved for the benefit of Egypt from 1 January to 15 July when, in respect of any additional area irrigated, compensation water at the rate of 800 m³ per month had to be released from the Sennar reservoir, and the extent of irrigation by pumps during this period was therefore limited by the availability of surplus stored water after the demands of the Gezira were satisfied. Since 1939 the licensing and operation of all pump schemes has been controlled under the Nile Pumps Control Ordinance by the Nile Pumps Control Board.

The pump schemes were of four types: government schemes cultivated by tenant farmers, ranging in size from 2000 to 30,000 feddans; private schemes with tenant cultivators, generally of a fair size; private schemes financed and

operated by a cooperative society; private schemes worked by the owner or his agent (most of the smaller schemes were of this type). There was a great variation in the size of the private schemes, from a few feddans served by a two-inch diameter pump to large estates of over 40,000 feddans.

The development of pumped irrigation was left almost entirely to private enterprise. The main contribution made by the government consisted of ten schemes in the Northern Province serving 40,000 feddans, eight schemes on the White Nile, serving 44,000 feddans, and the Goneid scheme on the Blue Nile serving 30,000 feddans. These projects demonstrated how pumped irrigation projects should be established and operated and thus led the way for private development.

Records of licences issued in 1944 give a total area of 180,000 feddans for perennial and flood licences covering 370 schemes. As a result of the post-war expansion, by 1956 perennial and flood licences had increased to 619,000 feddans.

It was estimated that a further 425,000 feddans were irrigated under the new class of 'restricted' licences which only permitted pumping from 15 July to 31 December. It is also recorded that the total area of 1,044,000 feddans was made up of more than 2,000 individual schemes. The distribution on the river system has been assessed to be approximately as follows:

	Private schemes feddans	Govt. schemes feddans
Main Nile	200,000	40,000
White Nile	432,000	44,000
Blue Nile	300,000	30,000
	932,000	114,000

The Zeidab scheme was the first pumped irrigation project in the Northern Province. In 1904, Leigh Hunt, an American philanthropist, obtained an option on 11,000 feddans to grow cotton. The Sudan Plantations Syndicate acquired the option and in due course this was extended to 23,600 feddans. The project was most successful and was in fact the forerunner for the Gezira scheme. The government schemes were established during and after World War I to grow food crops, by the Department of Agriculture, who continued to administer the farming operation. The farmers paid a water rate and a three- or four-course rotation was strictly enforced including wheat, dura and pulses. On the larger private schemes the conditions were quite different. Few of the schemes followed any rotation, holdings were let at exorbitant rents or cultivated by working partners who paid half share to the owners, and tenants had no security.

The main crops were wheat in the Dongola/Merowe area, and haricot beans in the Shendi area. With the exception of a few of the cooperative schemes, the standard of farming in the Northern Province schemes was poor.

Throughout the Blue Nile Province pumped irrigation was developed to grow cotton. The government schemes were managed by the White Nile Alternative Livelihood Board, the authority responsible for the schemes constructed for farmers whose lands had been flooded by the Gebel Aulia reservoir in 1937. A three-course rotation was adopted, and the farmer holdings varied from 15 to 18 feddans. Cropping was one-third cotton, one-sixth dura and one-sixth lubia.

The large private pump schemes also had 15-feddan holdings and generally followed the three-course rotation adopted for the government schemes, although lubia was omitted. On the small private schemes, cotton was usually the only crop, and the sole limitation on area cultivated was the capacity of the pump.

On the government schemes and the large private estates, the tenants were responsible for seed, ploughing and all labour input, while the 'owners' provided the land, irrigation and management. The proceeds of the crop was shared 60 per cent to the 'owners' and 40 per cent to the farmers.

The legal responsibilities of the scheme owners and tenants were defined by the Nile Pumps Control (Blue Nile Province Tenancies) Regulations - 1947, so that the farmers' performance and conditions were far superior to those of the Northern Province tenants, except for the fortunate few on the Zeidab scheme.

The policy of leaving the development of pump schemes to the private sector meant that over 900,000 feddans was brought under irrigation at no cost to the government.

On the White Nile, with the exception of the large post-war schemes, the standard of construction was poor due to the shortage of capital input. The construction and operation of the Blue Nile schemes was generally good.

On the Main Nile, agricultural and irrigation development suffered from the fact that except during the war years, when wheat was at a premium, there was no profitable cash crop. In spite of this shortcoming, the question does still arise as to how and why conditions on the larger estates were so bad and the exploitation of the tenant farmers and the land came about.

The Gezira Scheme

The Gezira or 'island' is the triangle of land enclosed by the Blue Nile and White Nile running south from Khartoum to Sennar. The topography, a gently sloping plain traversed by low ridges, was eminently suitable for a gravity canal system. The impermeable clay soils provided excellent material for canal construction and due to their good structure, also proved suitable for irrigated agriculture.

The area was fairly well populated by settled tribes cultivating a single crop of *dura* during the rainy season, from July to October. The success of the crop was fairly certain in the south, but rainfall was generally inadequate in the northern Gezira.

Thus the Gezira contained the essentials for large-scale irrigation development, an extensive area of irrigable lands (in due course the soil survey identified over two million feddans of suitable soils), a settled population and water from the Blue Nile.

In 1911 the Department of Agriculture installed the Tayiba pump scheme to irrigate 600 feddans near Wad Medani. The Sudan Plantations Syndicate were invited to manage it on a fee basis and to apply the experience gained on the Zeidab project. It was soon demonstrated that cotton could be grown in the Gezira as a flood and winter crop, sown in July and irrigated until March or early April.

In 1913 a complete project for 500,000 feddans was prepared incorporating a dam at Sennar to store 800 million m³. The principal crop was to be cotton. In 1914 a very much reduced scheme for 100,000 feddans was approved, with the dam to be built only to a sufficient height to command the main canal and without storage. The estimated cost was £E one million. Although work was started on the construction of the dam and main canal in 1914, this was held up during the war years.

In 1913 the Nile flood was the lowest for 200 years and the Blue Nile discharges in 1914 were correspondingly low. It was demonstrated that in such a year Egypt would require all the natural flow of the river from 18 February, corresponding to 18 January at Sennar - much earlier than 28 February, the date which had previously been assumed for termination of 'flood' water withdrawals by the Sudan. By 1918 the whole project had been reconsidered and it was decided to build the dam to the full height from the start, to provide storage to meet the irrigation requirements of the Sudan after 18 January. The area of the first instalment was increased to 300,000 feddans to finance the additional cost of the project which was planned to allow a subsequent extension of 1,000,000 feddans.

Thus emerged the project which was in fact implemented between 1919 and 1926. Prior to starting work it was still necessary to resolve the problems of management, Nile waters, finance for construction and land tenure.

Both at Zeidab and on the Gezira pilot at Tayiba it was apparent that the system of charging the farmers a water rate (of £E 2.5 per feddan) was not satisfactory. It did not provide adequate return to the owners and at the same time the farmers were reluctant to pay a higher rent, which could cause them to lose money when cotton yields were low. In 1912, a study of local practice for *sagia* cultivation revealed that the native system was a partnership in which

each factor of production had definite shares of the crops allotted to it as follows:

Ownership of land	10.0%)	
Supply of irrigation	36.66%)	60%
Supply of seed, implements	13.33%)	
Supply of labour		40%

The arrangement found favour with the government because the charges on the tenant would vary with the profits of cultivation and at the same time gave government and tenant a mutual bond in adversity or success. It also provided a practical method of doing the same between the government and the Syndicate by passing on some of the owners' 60 per cent share of the crop in return for technical management and a contribution to the capital costs.

In 1913 it had been tentatively agreed by the Syndicate that the Tayiba agreement should be cancelled and the development of the Gezira should be undertaken on a partnership arrangement, the gross profits being distributed to the government 35 per cent, to the Syndicate 25 per cent and to the tenant 40 per cent. Gross profits for the Gezira scheme were calculated on the cotton crop and the tenant received full benefit from dura (grain) and lubia (fodder). A formal agreement was not concluded until 1919, and significantly modified in 1926.

In 1919 the cost of the project was estimated at £4.9 million and the British government guaranteed the interest on a Sudan loan of £6 million. As early as 1920 it was apparent that costs of materials and labour had increased to such an extent that the previous estimates were quite inadequate. An expert examination was made of the full cost of the work and it was estimated that this would be £11.5 million. (For finance, see the paper by Carmichael above).

In 1906 a cadastral survey was started. The land was divided into minute squares (sides of 1.8 km). Each corner was marked with an iron beacon showing a latitude and longitude. Property boundaries were established and a land settlement party worked with the cadastral survey to obtain a title to all lands held within the demarcated area.

The land was compulsorily rented by the government. It was therefore possible to lay out a regular grid of canals and field boundaries superimposed on the old boundaries. The rent was fixed at the current rate of 100mm per feddan for agricultural land. The registered land owners had first claim to holdings on the Gezira Scheme.

The problems concerning water, management and finance having been resolved, the construction of the Scheme proceeded apace. The Sennar dam and first 300,000 feddans of canalisation were completed between 1920 and 1926. During this period two pumping stations were installed at Hag Abdulla

and Waddel Nau to irrigate an area of nearly 50,000 feddans where it was possible to practise the agricultural methods proposed for the Scheme and at the same time get together a nucleus of staff and farmers accustomed to irrigated cultivation of cotton and dura.

A policy of extension was pursued after 1926 to spread the high capital cost of the Sennar dam and main canal. With the exception of the war years from 1939-1946, construction proceeded steadily until 1952, when the area of the Gezira Scheme was 972,000 feddans. In addition the Abdul Magid Alternative Livelihood scheme (38,000 feddans) in the north, completed in 1941, brought the total area served from Sennar dam to more than one million feddans (1,010,000). The capital cost of irrigation works is recorded as E 6.3 million for the dam and £E9.3 million for the canalisation, a total of £E15.6 million.

The Sudan Plantations Syndicate (and the Kassala Cotton Company) were responsible for the on-farm works such as land levelling, the construction of water courses and field channels (or *abu sitta*) together with ancillary works such as ginneries, workshops, and housing, offices and transport for the agricultural staff. The Syndicate also installed the Gezira Light Railway, which served to distribute seed and fertilizers and collect in cotton to the ginning factories.

The overall length of the Sennar dam is 3.025 km, of which 1.607 metres is masonry and the remainder consists of a masonry core wall with earth embankments. The main flow of the Nile passes through 80 sluices, 8.4 metres high and 2.0 metres wide. In addition there are 92 spillways, each 5.0 metres wide, to deal with high flood discharges. The main canal head regulator was built into the western solid masonry section of the dam.

The main canal runs northwards from Sennar dam for nearly 200 km and is the main artery for irrigation. The first cross regulator is 57 km from Sennar, and below this point the canal is divided by cross regulators into reaches which vary in length from 6 to 22 km. There are two branch canals, the Tabat branch and the North-west branch which take off the main canal at km 91 and 169 respectively. The branch canals are similar to the main canal.

The major canals take off from the main and branch canals at the cross regulator groups, and are divided into reaches of about three km by cross regulators. The offtakes are, so far as possible, grouped at these points and through the weirs are passed measured discharges to the minor canals. The even topography and gentle slopes found in the Gezira make it possible to lay out the minor canals from each major canal to a grid pattern, spaced at intervals of 1,420 metres. This was to accommodate the fields or 'numbers' of 90 feddans, made up of nine 10-feddan plots. The 'numbers' are supplied from a water course (or *abu isherin*). These were also set out to a regular pattern, superimposed on the existing property boundaries, which was possible because of the rent paid to the owners.

The lengths of the various categories of canals in the Gezira scheme were approximately as follows:-

	km
main and branch canals	320
major canals	700
minor canals	3,500
water courses	15,000

The responsibilities of the three partners were defined in the 1919 agreement between the government and the Sudan Plantations Syndicate. The government was to bear the cost of leasing land, construction and maintaining the main works and canals to bring water to the land. The Syndicate were to act as government agents in allocating tenancies, to direct and supervise the cultivation and provide loans to the tenants, and to cover the cost of roads, drainage, agricultural and accounting staff. The tenant was to provide the labour, seed, agricultural implements and use of tillage animals.

So far as the canal system was concerned, the Sudan Irrigation Department maintained the main, major and minor canals, while the Syndicate, through the farmers, maintained the water courses (*abu isherins*) and farm channels (*abu sittas*). For the day-to-day distribution of supplies, the Syndicate operated the minor canals and indented for their requirements on the irrigation staff who arranged to deliver the correct discharges to the individual minor canals. A feature of the irrigation system was the arrangement for storing the flow by night in the minor canals. This meant that main and major canals could flow continuously and at the same time there was no need for the tenants to take water by night. In addition, the fully regulated canal system could provide an 'on-demand' irrigation supply.

A three-course rotation was first adopted, but due to excessive weed infestation this was changed to a four-course rotation in 1931. A standard holding was 40 feddans, of which 10 feddans was under cotton and five under dura. A certain amount of lubia was also grown; this, together with village gardens, made up a cropped intensity of about 40 per cent.

The tenants numbered about 26,000, some farming 'half-holdings' only. Although the 1919 agreement required that the tenants, in return for a 40 per cent share of the proceeds of the cotton crop, provided all labour, seed, agricultural implements and use of tillage animals, the cost of certain operations were shared by the three partners, when the agricultural input increased due to such activities as pulling of the cotton stalks. The same arrangement applied when deep ploughing, fertilisers and spraying with pesticides were introduced.

When the Syndicate concession expired in 1950, the government set up the Sudan Gezira Board to take over the responsibilities of concessionaires. With a few exceptions, all the concessionaires' staff transferred to the Gezira Board.

One significant change was that for the first time Sudanese nationals were recruited for the field staff. The original distribution of profits was maintained. The Board's 20 per cent share was, however, earmarked to meet certain specific charges for research, social services and business profits tax, as well as the Board's operating expenses, estimated at £E3.5 per feddan of cotton.

The fluctuating performance and results of the scheme are analysed above (see Carmichael). A measure of the tenants' benefit over the period 1925-1950 is the annual profit paid for a 40-feddan tenancy, which ranged from nil to £E281. The average figure was about £E55 tenancy. Additional benefits were advance cash payments for the cotton cultivation which were about £E18, and the produce from the five feddans of dura, probably worth as much as £E20, making a total average 'take' of £E93 per annum.

The average dividend paid to Syndicate shareholders over the years 1926-1950 was nine per cent. Although there was a loss in 1931, the concessionaires were not so severely hit during the 1930s as were the tenants and the government.

It is an interesting coincidence that the government and concessionaires both netted the same amount, £E16 million. It might be thought that this was a high price to pay for the companies' contribution to the project. They did, however, have to provide from their funds for amortisation of certain costs, dividends to shareholders and taxation. In addition the Syndicate sponsors in England played a large part in persuading the British government to guarantee the loan, and there is no doubt that private enterprise was the catalyst which kept the project alive in the years before construction ensured the ultimate financial success of the Gezira Scheme.

Certain aspects of the Scheme were criticised over the years. The major criticisms were, firstly, that the tenants were not developing as farmers and were no more than plantation workers and that (in 1942) their living conditions had not materially improved; secondly, that the cropping intensity was too low and should be increased to 75 per cent; and thirdly that the division of responsibility between the Ministry of Irrigation and the Sudan Gezira Board was unsatisfactory and that all agricultural and irrigation staff should be under one management.

There is, however, no doubt that the Gezira Scheme was a magnificent example of how to introduce irrigated agriculture to a peasant farming community in underdeveloped countries. The standard of farming and irrigation operation was exceptional and the involvement of private enterprise ensured an efficient and cost-conscious management.

Future planning

In addition to the irrigation development implemented during the Condo-

minimum period, there was considerable planning for the future. The designs for the Managil extension to the Gezira scheme (about 900,000 feddans) were completed in 1955. The Jonglei Investigation was carried out from 1947-1953, and plans prepared for the Jonglei Canal and measures to protect the livelihood of the inhabitants of the Sudd area. Throughout the period, from the early years of the century, the Egyptian Irrigation Service carried out routine gauging and discharge measurements throughout the Nile Basin. This provided the basic hydrological data necessary for planning any conservation work and irrigation development in Egypt and the Sudan.

By 1952 all the storage in Sennar reservoir was committed for use in the Sudan. In 1955 the decision was made to construct the Roseires dam. At about the same time negotiations were started on the division of the Nile water between the Sudan and Egypt after the completion of the Aswan High dam in Egypt and the Roseires dam in the Sudan. The Sudan's case was based on a country-wide survey carried out by consultants to assess the irrigable areas in the Sudan. In addition, Humphrey Morrice and W.N. Allan set up a mathematical model of the Nile Basin on a computer, something which had not previously been attempted. This meant that all alternatives for conservation and use of the Nile waters could be quickly assessed, and for the first time the Sudanese delegates were in a position to justify their arguments for additional supplies.

In 1959 a new Nile Waters Agreement was made between Egypt and the Sudan. With the completion of the Aswan High dam to provide full control of the main Nile flow, the concept of 'timely' water and compensation water for the Sudan's withdrawals during the 'timely' period was no longer relevant. The agreement divided the average Nile flow (84 mld m^3) after losses in the Aswan Reservoir (10 mld m^3) between Egypt (55.5 mld m^3) and the Sudan (18.5 mld m^3).

Conclusion

During the Condominium period irrigation was brought to nearly 2,400,000 feddans, as follows:

	Feddans
Northern Province basins	130,000
Gash scheme	c.200,000
Pump schemes	1,044,000
Gezira and Abdul Magid schemes	1,010,000
Total	2,384,000

The Gezira Scheme made the Sudan's reputation for successful irrigation development. The unique features of the Gezira Scheme which largely contributed to its success were, firstly, that the partnership arrangement, with the

great benefit of the concessionaires' participation and the element of private enterprise, encouraged efficiency from all three partners as well as maximisation of the profits. Secondly, the renting of the land from the owners overcame the problem of irregular property boundaries and canal layouts. The reticulated canal system allowed standardisation of the canals and structures and consequently speed and economy in construction. Thirdly, the cooperation between the agricultural and irrigation field staff ensured reasonably efficient use of water.

Since the Sudan achieved independence, irrigation development has stormed ahead, based on the Gezira techniques with a government board substituting for the concessionary companies. During the 1960s, extensions to the Gezira Scheme more than doubled the area served from Sennar to over two million feddans. The New Halfa or Hashm el Ghirba project brought in another 400,000 feddans and the Rahad Phase I, a further 300,000 feddans. In addition, various smaller projects made up over 300,000 feddans so that in the period 1956-1980 the irrigated area has been increased by more than two million feddans.

Note

This paper has largely been based on the following sources:-

Allan, W.N. & Smith, R.J., 'Irrigation in the Sudan' in Tothill, J.D., *Agriculture in the Sudan* (London, 1948).

Sudan Irrigation (Ministry of Irrigation, Khartoum, March 1957)

Gaitskell, A., *Gezira - a story of development in the Sudan* (London, 1959).

THE GEZIRA SCHEME

Charles Smith

For five years after 1930 the yield from the Scheme fell alarmingly, at the same time as the price of cotton slumped. The recovery in cotton yields from 1935 was outstanding and sustained, although any satisfactory recovery in cotton prices was delayed for another ten years. Historians have asked what difficulties had to be overcome on the ground before the Gezira proceeded from comparative failure to remarkable success.

The reduced yields in 1930-34 were mainly due to the rapid increase of the bacterial disease 'Blackarm' and later the virus disease 'Leafcurl'. Scientists at the Gezira Research Farm at Wad Medani were very active in investigating the causes and advising methods of control.

Blackarm was first recorded as harming the yield of the 1923-24 cotton crop and it was hoped that a chemical treatment of sowing seed would give control, but gradually and continuously Blackarm had been penetrating cotton crops from old to new until in 1929, with climatic conditions most favourable to its spread, it flared up everywhere. Leafcurl too was noticed on isolated plants in the 1925-26 crop and by 1929 its spread was universal, with help from white fly transmitting the virus from infected ratoon cotton plants from the previous seasons.

To control Blackarm, new clean sowing seed was imported from Egypt each year and treated with *ababit B*, an improved mercurial seed dressing. As the climatic effect on the spread of this disease appeared to relate the intensity of Blackarm infection to the actual number of rainstorms which the plant experienced, the starting date of cotton sowing was delayed until 1 August 1931 to avoid early rains. Also the dura and lubia crops were removed out of the rotation into separate areas. The resulting cotton yield in 1931-32 of 4.1 kpf looked hopeful.

In 1932-33 the yield again fell to 1.9 kpf. It was a year of very late cotton sowing due to wet weather conditions, which also resulted in a high survival of the previous year's cotton ratoon plants heavily infected with Leafcurl. It was now decided to stop cutting out cotton stalks at the season's end and to introduce the arduous practice of pulling out stalks and roots and sweeping up and burning all debris on the cotton rotation.

It had been established that sowing too early increased Blackarm, sowing late increased the risk of reduced yields from Leafcurl infection, and irrigation of dura and lubia crops on the previous year's cotton planting caused the growth of diseased ratoons and volunteer cotton seedlings. It was decided to replace in

1933-34 the three-year rotation with a new eight- (double four-) year rotation again including the dura and lubia crops but with a fallow year after each cotton crop.

In 1934-35 a new strain of sakel cotton resistant both to Blackarm and Leafcurl was sown on 12,800 feddans in plots throughout the Gezira. It gave an increased yield of 5.3 kpf compared with 4.3 kpf in control plots. It had been developed by A. R. Lambert of the Gezira Research Farm from some disease-resistant and clean sakel (*Sakellarides*) plants he had found in 1930, and is now universally known as Lambert or L cotton.

This variety, while outyielding sakel, is of a slightly coarser grade of lint but it flourishes in the southern half of the Gezira where Leafcurl is more prevalent, rainfall heavier and soils richer than in the northern Gezira.

By plant selection at Shambat and Barakat seed farms, and the build-up of sowing seed supplies in the disease-free Tokar district in eastern Sudan, the valuable variety of Sudan sakel was preserved. It was decided to continue growing sakel cotton in the drier northern Gezira to provide the higher priced finer grades of lint cotton for which there was demand and to increase the area of Lambert in the southern Gezira.

It is now evident that the three most important factors responsible for the recovery of the Gezira Scheme from near disaster in 1933 were:

1. The changeover from a three-year rotation, with its two consecutive years of irrigation in every three, to an eight-year rotation introduced in 1933-34, when the shortage was not of land but water. The rotation is as follows:

Year		
1	cotton	after one fallow year and lubia (legume) year.
2	fallow	allows complete clean-up of ratoon and debris and weeds for control of disease.
3	fallow	a second fallow before cotton increases the following cotton yield especially if fallow weeding clean-up is done.
4	cotton	after two fallow years.
5	fallow	allows complete clean-up of ratoon, cotton debris and weeds.
6	dura	after a fallow, increases crop by 50 per cent over three-course rotation.
7	lubia/ vegetables	legume fixes nitrogen.
8	fallow	before cotton.

There can be no doubt that the establishment of this rotation was a major factor in the general clean-up of disease and pests and perennial weeds, including *Seid* grass, whose competition reduced crop yields. Over the 21-year period from 1934 to 1955, the eight-course rotation showed that cotton yields increased by 10 per cent and *dura* by 50 per cent over those in the three-course rotation. In this wider rotation, and at those yield levels, there is a reduction in irrigation water required for each *kantar* of cotton grown, and for each *ardeb* of *dura*. With fallow years between crops, perennial weed growth is reduced. Wider and deeper cracking of the 60 per cent clay soils in the fallow years allows following irrigation water to penetrate to lower soil depths thus stimulating deeper rooting of cotton plants, more vigorous plants and increased yields.

2. The discovery by A.R. Lambert of the higher yielding and disease resisting strain of *sakel* now called Lambert.

3. The early pulling out of cotton stalks and roots, instead of cutting down the stalks, in April and early May and sweeping up and burning of all cotton debris and noxious weeds in order to create as long a 'scorched earth' period as possible before mid-July when sowing the new cotton crops was started. The longer this period in the very hot dry months of May and June the greater the control of diseases and pests.

Other ways of protecting and increasing crops were: firstly, crop spraying when insect attack had built up. Jassid fly was noticed in 1940 and by 1944 it had increased menacingly especially in the drier northern Gezira. In 1946 1,000 feddans were sprayed with DDT with a resulting 40 per cent increase in yield. From that time onwards crop spraying by land machines, and later aircraft, became a routine operation when Jassid insect numbers were increasing. Secondly, the increase in perennial weed growth resulting from two consecutive irrigation years could be controlled after the introduction of the eight-course rotation by deep dry ploughing in the fallow years thereby cutting and withering the deep roots of *Seid* grass (*Cyprus Rotundus*).

In addition, final cotton yields can be increased by the tenant's efficiency in the field with: early weeding when weeds are small to prevent competition with crops; completion of sowing before mid-August, to improve yield and grade, with correct spacing between plants; early thinning leaving a sufficient plant population per feddan; the application of nitrogenous fertilizers evenly; correct irrigation intervals and amounts of water applied; efficient arrangements for picking cotton; early removal and burning of cotton stalks and debris.

Although it is only the cotton crop which is shared by all three partners, while the *dura* and *lubia* crops are the entire property of the tenant free of any charges, there is always the need for maximum efficiency in all crops grown. It was the duty of the management to ensure that the tenant should cultivate the

land in a proper manner according to rotations laid down and the product to the tenant of a free five feddans of well grown irrigated dura would be considered by many a satisfactory reward.

With the changes in agricultural policies and the drive for efficiency after the depression years of 1930-1934, it appeared that the tenant had more work and less liberty with no economic advantage, giving an impression of his being only a labourer on his own land, that tenants were merely 'rural wage labourers' or 'plantation labourers'.

This seemed to be the opinion of certain officials and others who perhaps could not understand that the discipline of improved agricultural methods was essential for increasing the stability of the Sudan, that the status cart should not be put before the economic horse. Disciplines, mentioned so often, included those of irrigation practices tied to agricultural operations, for without co-operation an extensive irrigation scheme could not function.

The field inspector, (there were about 100), was resident among the tenants in the Block to which he was posted. In the early years he was the manager of the area, the supervisor of work to be done, the organiser of the distribution of fertilizer, cotton seed, cotton sacks, of ploughing and sowing programmes, of local water control. He indented water requirements twice-weekly for irrigation of crops, and tried to keep all agricultural operations up to date in the crops establishment season of July to September and the cotton picking and cleaning up seasons of January to mid-May. The inspector also arranged frequent payments to his tenants, cash advances for work requiring the employment of extra outside labour and the later payments of his share of the net proceeds.

The tenant was not employed as a labourer but as a working tenant and partner entitled to 40 per cent of the net proceeds. If his efforts produced a large yield of good grade cotton his share was large. If he had not weeded his cotton plot, had sown late and not thinned nor irrigated properly or had allowed some of his lint cotton to fall unpicked to the ground, his share was small as was that of his partners - the government and the Syndicate.

With the passage of time some of the 30,000 tenants learned the needs and skills of cultivating cotton, dura and lubia, plus vegetables and groundnuts in part of their lubia rotation. These considered themselves as tenants and partners and the field inspector as their adviser and friend - especially after 1950.

Mrs Culwick, of the Social Development Department, conducted a social investigation for the Sudan Gezira Board on this question of the status of the Gezira tenant and the effect of his partnership in the Gezira scheme. She found in three representative Gezira villages that about 45 per cent of the population were tenants and their families, who preferred to be called 'partners' rather than tenants. The ownership of a tenancy was socially and economically attractive with a marked class distinction, and element of snobbery, between a

tenant and a labourer. Tenants owned about eight times more animals than did non-tenants, had a larger proportion of the better housing, more furniture and possessions, were less inclined to work or to expect their families to work. They wanted their children to be better educated and away from a background of labour. 91 per cent of the tenants were married with 54 per cent having married two wives in their time, compared with 58 per cent and only 20 per cent of the non-tenants. It was admitted by these people that before the Scheme came to their village everybody would happily turn out for weeding, sowing and harvesting their rain crops.

World War II: Syndicate to Board

With the outbreak of World War II, when about half the field staff left in 1940 and 1941 to join the armed forces, the involvement of local village councils and tenants helping the Gezira management was a first step in devolution. Village councils became more active and their number increased from 26 in 1941 to 273 in 1947. Wartime 'agricultural sheikhs' or *samads* were appointed to assist the field inspector (who now had twice the area and double the number of tenants to supervise) in communicating with councils and tenants. These war-time *samads*, 297 in 1941, were phased out to 24 in 1947 and were gradually replaced by village council *samads* who increased from 35 in 1941 to 523 in 1947, as the village councils became more capable of agricultural devolution.

A Gezira Tenants Association, which later became the Gezira Tenants Union, was formed and kept in close touch with the Managing Director and General Manager to discuss questions of sales policy, payments of profits and agricultural or other matters. It was interesting to observe that the momentum of past experience of agricultural routine maintained good yields and economic returns.

The government had given notice in 1944 that the Sudan Plantations Syndicate concession would not be renewed; it ended in June 1950. On 1 July 1950 the administration of the Gezira Scheme was taken over by the Sudan Gezira Board, staffed by some 85 per cent of Syndicate staff who had been encouraged to stay on with similar remuneration and a compensation arrangement for any future Sudanisation of posts.

Independent management and agricultural and financial structures were understandably similar to that of the Syndicate and the share of net proceeds remained the same at 20 per cent, with a different distribution, and with new liabilities:

1. The promotion of social development by any means to benefit the tenant and others in the same scheme area.

2. The promotion of a Social Development Fund with an annual income of one-tenth of the Board's 20 per cent share between the limits of £E60,000 minimum and £E250,000 maximum.
3. An annual payment to the government of £E75,000 towards the cost of the research centre.
4. Payment of interest at 6 per cent per annum on £E4 million of capital assets, as well as Business Profits Tax.
5. £E3.5 per feddan of cotton area would cover all other Board expenses. Any balance of the Board's 20 per cent share after meeting all the above charges would be divided one half to the Board's reserves and one half to a Tenants' Reserve Fund.

The cotton yields for the first five years of SGB Management were maintained at a high level. The financial level of the 1950-51 record 6.8 kpf cotton crop was also very high, the tenant's share averaging £800 per tenancy.

From 1949 until 1955 there was a rapid recruitment of Sudanese field staff with a yearly intake sufficient to Sudanise half the staff by 1956, after the normal wastage and retirement rate in the existing expatriate field staff.

In 1955 the deputy Managing Director, Sayed Mekki Abbas, became the first Sudanese Managing Director of the SGB and, after the complete Sudanisation of the British field staff in that one year, the young Sudanese field staff were promoted to senior field posts. I left the Gezira in 1955 but I was privileged, (during further service in the Sudan from 1955 to 1962 in an advisory capacity financing pump schemes on the Blue and White Niles) to be welcomed always to the Gezira to see for myself the efficient way the scheme was managed by a dedicated staff determined to succeed.

The change of rotation to the eight-course, with 50 per cent cropping, has been criticised in the statement that 'the cropping intensity is too low and should be 75 per cent'! It may be that there is now considerable pressure to increase cropping. Before adding to the cropping of the Gezira's impervious clay soils, however, the probability must be considered that excessive irrigation of these soils would increase salinity in the higher soil levels and thus reduce fertility in future years. No land was brought into the Gezira Scheme before a strict soil survey had eliminated all areas with a high saline content, and large areas within the various Blocks were left out of cultivation for this reason. Thus the margin between fertility and salinity in the Gezira clay soils may be narrow and this must be considered before cropping changes are made, even though water is now plentiful after the building of the High dam in Egypt.

Any increase in cropping must be adequately irrigated to produced economic yields. This may not be possible with the present condition of canals and water channels which would need redesigning and clearing before sufficient water could be delivered for the required additional irrigation. I do

not know of present day practices or crop yields in the Gezira, but if the eight-course rotation is abandoned and land usage increased, crop yields over future years will reveal the effects, for all to see.

Note

The history of the Gezira from 1900 to 1955 is brilliantly described in Gaitskell, A., *Gezira - a story of development in the Sudan* (London, 1959).

A NOTE ON THE SUDAN PLANTATIONS SYNDICATE

G.R.F. Bredin

Historians have posed the question, what practical lesson does the experience of agricultural development in the Sudan offer other countries? The benefits of the Gezira Scheme, which over many critical years contributed about half the entire revenue of the Sudan, have not been confined to the Sudan. It remains a blue-print for successful projects in cooperative agricultural development throughout the world and has its followers in many countries.

It embodies two essential principles. The first is that, before any wholesale commitment is undertaken, experimental areas must be developed to establish the suitability of the soil and climate for the cash crop which it is proposed should be grown, and also the availability and capacity of the local agricultural labour force to undertake the rigorous and unaccustomed cycle of cultivation involved. Secondly, that the labour must be provided in the main not by hired cultivators but by the owners of the land in partnership with those who are contributing the management and financial backing. It was disregard of these vital principles which brought disaster on the ill-fated East African Groundnut Scheme.

The full cooperation of all these partners, an equally essential factor, was forthcoming throughout, in spite of somewhat divergent objectives. The company, in duty to its shareholders, had to aim at securing the maintenance of income at the highest possible level, whereas the government, forced to take a longer view by the prospect of ultimate Sudanese independence, pressed from time to time for measures of devolution which must involve some immediate fall in efficient farm management.

That reconciliation was always found between such divergent policies was due to the admirable relations which prevailed between government and Syndicate, reinforced as they were by firm individual friendships.

Similar cooperation was also called for from both sides at all levels. The Gezira Scheme, with its comparatively dense population and its carefully controlled water supply designed to cope with a closely organised agricultural cycle, called for special measures to preserve public health, to maintain public security (especially during the seasonal inflow of large numbers of immigrant pickers) and to carry out detailed research into the causes and prevention of disease both among the village population and in the cotton crop.

The field staff of the Syndicate were called upon at all times to work in close touch with the government irrigation engineers, public health staff, police, and research workers in carrying out these essential duties.

It was thus, in every sense, a team effort. With the outbreak of World War II and the call to raise local forces to defend the country against invasion by the Italian army in Abyssinia, the younger members in the service of both government and Syndicate, with their knowledge of Arabic and their experience in the handling of African personnel, were in strong demand by the military authorities. As many as possible were released for war service, thus placing on the shoulders of those who were left behind a much increased burden which was splendidly borne.

Another outstanding contribution made to the Sudan's war effort by the Syndicate was in the use of its controlled water supply to produce a heavy surplus of food crops. This was transported to more needy areas and did much to restore a situation rendered precarious by the cutting of the Sudan's supply lines.

I would like to conclude by paying two tributes. The first is to the courage and determination of the company's Board of Directors, inspired by the formidable figure of Sir Alexander MacIntyre, which saw the scheme through the dark days of falling prices and dwindling yields in 1931 and took the firm steps which resulted in eventual recovery and restored profits. Finally, I would like to salute the members of the Syndicate's field staff. Working in far from comfortable accommodation, performing, in a very trying climate, a highly responsible and at times frustrating task, they carried on with indomitable energy and unfailing cheerfulness. They bore, in every sense, the burden and heat of the day, and to them, and to their gallant wives, was due in major part the success of this great enterprise.

AGRICULTURAL DEVELOPMENT IN THE SUDAN DURING THE CONDOMINIUM

Alan McCall

First, we should remind ourselves of the vastness of the Sudan, and the diversity of its soils and climate. It is a country of immense plains, interspersed with rolling country and a few widely separated hills or mountains. Its soils are varied. In the north they are predominantly sandy, often with little water-holding capacity. In the far south there are the more permeable red ironstone acid soils. In between there are vast areas of heavy almost impermeable alkaline clays. Permeable river silts are found along the river banks and in the flood plains of the Baraka and Gash deltas. The climate is generally hot. Rainfall varies from nil in the north to 60 inches or more in the south, producing a landscape that changes from barren desert to high grass woodland and closed forest in the south. And through it runs the Nile and its affluents, providing a source of water without which agriculture cannot thrive.

For agriculture to progress it must be scientific and backed by properly planned agricultural research. I believe one of the major contributions made to the economic development of the Sudan was the quality of the research achieved during the Condominium years. In 1902 and 1903 the first experimental farms were started in the Northern Province and near Khartoum specifically to explore the possibilities of irrigated cotton, and at Rumbeck and Wau in the southern Sudan to work on rain-grown cotton and other crops. The Wellcome Tropical Research Laboratories were presented by H.S. Wellcome in 1903 and undertook chemical and entomological research relating to agriculture. Botanical and agricultural research was initiated at the Shambat Agricultural Experimental Station in 1904. Much work was carried out by these two organisations on analysis and classification of soils, identification and classification of plants and on pests, and diseases of crops and stock. Experiments on the cultivation under irrigation of crops such as cotton and wheat yielded valuable information. Many other crops were tried but cotton was given the most attention. It is worth quoting from an internationally-known scientist, Dr B.A. Keen, in the mid-1940s: 'It is in the Sudan, at the Gezira Research Farm, Wad Medani, that the greatest development of modern field experiment technique is to be found'.¹

A sorghum expert was appointed in 1928 who began a systematic collection of varieties from all over the Sudan and initiated varietal trials. Later on, and particularly after World War II, work was expanded to include preliminary trials on other crops such as wheat, sesame, dukhn (pearl millet), castor oil, various beans, groundnuts, etc., but the development of this work in the

different areas of the Sudan was largely the concern of Inspectors of Agriculture, helped by the research staff when time permitted. As a result valuable research was carried out in all areas of the Sudan with the object of improving local crops and introducing new varieties.

The Alternative Livelihood Schemes were established in 1938 and the following two years to provide an alternative livelihood for the riverain people affected by the construction of the Jebel Aulia dam. The Abdel-Magid Scheme was the largest of these and was an extension of the Gezira Scheme. But there were interesting smaller schemes developed on the White Nile at Fatisa, Hashaba, Um Gerr and Wad Nimr, irrigated by pumping from the river. All the tenants on these schemes grew some cotton on their holdings, as well as food and forage crops.

It was believed from early days that cotton could also be grown under rainfall in areas where irrigation was impossible. In 1923 it was decided to attempt to introduce cotton as a cash crop into the Nuba Mountains. Various schemes were considered including a proposal by the Sudan Plantations Syndicate. Eventually it was decided that the Department of Agriculture should establish a cotton-growing industry, and the first crop was sown and harvested in 1925-26.

About this time a scheme was put forward whereby the British Cotton Growing Association and the Empire Cotton Growing Corporation were to take equal shares with the government in a company whose object was to be the buying, ginning and marketing of cotton grown in the Nuba Mountains and also any other cotton grown in the southern provinces. (Cotton growing in Upper Nile Province had been started in 1923 but ceased after some ten years.) This proposal was also turned down as it was considered preferable for the government to keep the industry under its own direction. Thereafter production increased rapidly and eight ginning factories were erected in the more important centres. In 1934-35 a crop of over 400,000 small kantars of seed cotton was produced.

Large quantities of gum arabic were collected in Kordofan Province, providing cash for the inhabitants. In addition, the *goz* or sandy soils of the area produced excellent crops of groundnuts and sesame, much of which was exported to Khartoum and elsewhere.

Cotton growing started in 1926 in the Torit-Opari-Kajo-Kaji area with ginneries at Torit and Shukoli, and in the Maridi area in 1928 with a ginnery at Maridi. Production continued in the Torit area for about ten years but was then given up. It was much more successful in the Maridi area and extensive trials throughout the rest of the Zande area as far west as Tembura proved that cotton was a suitable crop for most of this area. The result of these trials, and the good crops around Maridi, encouraged Dr Tothill to choose cotton as the cash crop when he proposed the Zande Scheme.

An ecological survey of Equatoria Province by an eminent ecologist, Dr Myers, was started in 1937 as a first step in the economic development of the southern Sudan and the social emergence of its peoples. Because of its remoteness this area has, to a great extent, to be self-supporting and its exports to the world's markets have to be confined to those highly priced commodities which can absorb the great cost of transport. The survey was designed to explore both avenues of development. Dr Myers was also asked to make a botanical survey of the Province of Mongalla which, together with a soil survey, would provide the basis for a systematic policy of plant introduction and trial. Later the work was extended by adding an ethnological survey and by including the Bahr el-Ghazal Province when it was amalgamated with Mongalla to form Equatoria.

Dr Myers's work included the collection and growing of a very large number of varieties of field crops at Kagelu near Yei where organized plant introductions had been going on for many years. This station was originally within the Lado Enclave and the Belgians had made a number of significant introductions, such as rubber, coffee, oil palms, mango trees and other potentially interesting cash crops. This work had been continued and a wide range of plantation crops examined including sugar, tea, coffee, oil palms, tobacco, numerous varieties of fruit trees and plants for essential oil production.

When Dr Myers was killed in a motor accident near Lui in 1942 he had completed the groundwork of the survey. He had concluded that there would seem no insuperable obstacle to the building up of an economy within the province, independent of world prices, by which the agricultural tribes and the pastoral peoples, developing and extending on their own lines, could exchange their complementary products to the benefit of both.

This survey influenced Dr Tothill, Director of Agriculture, when in 1944 he proposed an experiment for the social emergence of indigenous tribes in remote areas. The policy recommended was to make these remote areas very nearly self-contained and enable them to market sufficient manufactured goods in the surrounding coastal belt to make available the comparatively small funds required for self-sufficiency. This economic development was to be a means to an end, the end being the social emergence and economic stability of the indigenous tribes. Zandeland was chosen for the experiment and it was the Azande and surrounding tribes who were directly affected and became involved in what became known as the Zande Scheme.

In 1946 the Equatoria Projects Board was set up to implement Dr Tothill's proposals. Zandeland was chosen for the experiment, rather than any other remote part of the South, because it enjoyed a number of advantages - reasonably good soils and climate, a comparatively large concentrated population, well organized and noted as being knowledgeable and industrious in their agri-cultural practices. However they were a very primitive people, still dependent upon and content with subsistence agriculture, cash as yet

having little attraction and barter being the normal means of exchange. They suffered severely from chronic forms of sickness and their every activity was ordered by superstition, fear of magic and witchcraft, oracles or tribal custom. The soils being good, only a modicum of work was required from a family to provide a varied and satisfying diet. There was therefore little urgency about life. The overriding claims of rulers, custom, the oracle and the dance called them from home for days and weeks at a time without anyone being very much the worse.

The key to the success of the scheme was the production of cotton by the Azande and its manufacture at Nzara near Yambio into a type of cloth in popular demand throughout the Sudan. Other projects included a sugar plantation where jaggery sugar was produced; the establishment of small oil palm plantations equipped with presses; the production of soap at Nzara. The potential of coffee as a cash crop was to be examined. Unfortunately the experiment had to be put into abeyance when the troubles started in 1955.

During World War II there was an urgent need for greater production of grain and the government pump schemes in the Northern Province were turned over to production of maximum quantities of grain and food crops. The new schemes at Aliab and Borgaig were developed to produce wheat. An attempt was also made to produce sorghum in the Gedaref rainlands using some of the unemployed from Omdurman and Khartoum. The scheme was abandoned when it was found that the producers ate almost as much grain as they produced.

However, the attempt focused attention on the rainlands and the need to develop mechanized production of crops in those areas. As a result, in 1945, the first experiments into mechanized production of sorghum were made in the open Ghadambaliya plains north of Wad El Huri station, using highly unsuitable equipment, the only machinery available at the time. These experiments were continued for a number of years and aroused a great deal of interest. They were of great importance. Without them, the mechanization of private farming in the district, which is now carried on over a wide area, would not have been so successful so quickly.

National attention was directed to the need for more research into the problems of crop production in the central rainlands of the Sudan, including the development of mechanized farming. This resulted in the setting up in 1952 of the Central Rainlands Research Station at Tozi. By 1955 the work at Tozi suggested that good levels of production could be attained on the clay plains on a farm scale with groundnuts, sesame, cotton and sorghum. A number of other crops, including sunflower and safflower were being studied and had shown promise. An important beginning was made at Gedaref and Tozi. In this connection I would like to pay a tribute to Dr John Smith, one of my predecessors as Director of Agriculture, whose vision and untiring efforts, often against considerable opposition, were mainly responsible for these

investigations. He was also the inspiration behind an ambitious programme of road making and *hafir* digging that sought to open up these rainlands and, by the provision of water supplies, to make their development possible.

The Rural Water Supplies and Soil Conservation Board was set up in 1944 with fairly wide terms of reference covering a variety of conservation projects. In the years that followed more and more emphasis was placed on the provision of rural water supplies, mainly by the digging of water storage *hafirs*. By the time the second five-year plan 1951-1956 came into being, it concentrated almost exclusively on *hafir* digging and the provision of access roads. Its programme of operations covered a very wide area.

It is difficult at this distance in time to assess the contribution that these activities made to the economic development of the Sudan, but I believe it was significant. John Jefferson wrote:²

Two thousand two hundred miles of new roads were created and two hundred and twenty-eight hafirs were excavated with a capacity of three million tons of water, say two million useful tons.

He calculated that 14,500 square miles, or 9 million feddans, had been opened up. Concerning specific increases in agricultural production that could be attributed to the existence of *hafir* water supplies he wrote:³

In the Paloich area ... grain exports rose from 15,000 sacks a year before the *hafir* system operated in 1949 to 50,000 sacks in 1951, and in the Nuba Mountains area .. cotton production increased from up to 12,000 tons to 31,000 tons in 1952 following the construction of hafirs.

Something must be said about the development of sugar growing in the Sudan. Very little work had been done with sugar cane prior to 1940 but about this time introductions of cane were made and trials laid down mainly in the southern Sudan. These were encouraging enough to justify the establishment of a small pilot project near Mongalla in an area that could be irrigated from the Nile, the idea being to produce a crop partly on rainfall, assisted by irrigation. About the same time a small plantation at Sakure near Yambio gave good yields of cane from which jaggery sugar was produced.

Meantime some promising trials had also been carried out on the Gezira under irrigation and, when a decision had to be made as to where to site the first sugar factory in the Sudan, Guneid, between Khartoum and Wad Medani, was chosen. The first commercial crop of cane was planted about 1954.

Another crop which received some attention shortly after was kenaf (*Hibiscus cannabinus*). Jute, used for sacks and for covering all bales of lint cotton produced in the Sudan, had become scarce and expensive. A fibre not

so soft as that of jute but acceptable to cotton spinners can be produced from kenaf. If this fibre could be produced locally and woven into sacking material, a huge saving could be made in foreign exchange. Kenaf has been grown in the southern Sudan for untold years and used for making hunting nets etc., and it was considered that the problem of growing the crop of produce fibre of a reasonable length could be overcome. Experiments had given promising results. The real difficulty lies in the extraction of the fibres from the plant after the crop has been harvested. This is traditionally carried out by a process of 'retting' which involves leaving the harvested plants in water until they rot, after which the separation of the fibres from the plant material is relatively easy. This is a very laborious and time-consuming process, requiring a large area of tanks and a considerable volume of water.

During the war a great deal of work was done in America on kenaf. In particular, a number of machines were developed to strip the fibres from the plant mechanically. These were by no means perfect but if my memory serves me correctly, one of these machines was ordered for the Sudan in the early 1950s but had not arrived by the time I left the country in 1955. Obviously a great deal depended upon how efficiently the machine would work in the Sudan.

I wonder if anyone present here today knows the rest of the story? Potentially this project was of considerable economic importance to the Sudan. I believe some kenaf was produced in the late 1950s on a pump scheme sited between Kosti and Malakal, using traditional methods of retting, but this project was later discontinued. It would appear that, as there is now no factory in the Sudan spinning and weaving its own locally produced kenaf, this was an item of agricultural development that did not develop.

I have only made brief mention of agricultural developments in the Northern Province, mainly because I do not know it well and because its agricultural land is limited, much of it being handicapped by the system of land factionation. During and immediately after World War I seven government irrigation schemes were established. Private pump schemes were also developed but despite the introduction of mechanical pumps, irrigation by wooden water-wheels continued as the basis of agriculture in the province, producing food crops, dates, fruit etc. These have made a contribution to the economic well-being of the Sudan.

Sayed Abdulla Bey Khalil, when he was Minister of Agriculture in 1949, wrote of the contribution of agriculture:⁴

It is not always recognized that it is only the development of agriculture during the last 50 years which has enabled the Sudan to afford its present policy of expanding social, educational and medical services.

Notes

1. Keen, B.A., *Agricultural development of the Middle East* (London, 1946)
2. Jefferson, J. H.K., *Soil conservation in the Sudan: development and projects* (Khartoum, 1952).
3. Ibid.
4. Foreword to Knight, R.L. & Boyns, B.M., *Agricultural science in the Sudan, a bibliography with abstracts* (Arbroath, 1950).

FORESTRY IN THE SUDAN, 1898 - 1955

W.L. Marjoribanks

The early Condominium government had little money to spare for forestry, but a start was made in 1900 by the appointment of an Austrian forester, an acquaintance of Slatin Pasha. He did not remain very long and was followed by two or three men from the Indian Forest Service, but, all in all, there was little development in the years preceding World War I. Rubber was at that time booming in the Far East, and attempts were made to grow rubber in Yei District and near Roseires; there was some success, but the high cost of production and haulage could not compete with Malayan rubber and the scheme was abandoned. The gum arabic industry was greatly helped by the opening in 1912 of the rail line to Port Sudan, and became a valued source of export revenue.

Probably the most noteworthy achievement of those early foresters lay in the introduction of plants from abroad, and two of these are worth mention. In 1913 a small parcel of teak seed was obtained from India, and the strain of teak thus introduced has proved so well suited to the conditions in Equatoria that it has never since been necessary to import other strains of teak; the large plantations of teak made after World War II were all of trees from seed collected from these first plantings. Another plant introduced at this time was the mesquite tree, from Mexico, planted at the Agricultural Station at Shambat in Khartoum Province. The plants were lined out to form a hedge bordering the fence which surrounded the station. No one paid much attention to these few dozen plants - mesquite's turn came later.

World War I and the decade after it were still the era of steam when large quantities of wood fuel were needed for river steamers and, later, for the steam-driven excavators which dug the main canal from Sennar dam and the other canals of the Gezira Scheme. The Forest Department had the responsibility for providing these supplies and for securing their replacement, but the immense amounts of fuel and charcoal needed for domestic use in an oil-less country continued to be met from the desert scrub surrounding the towns and villages of the central Sudan. Then, in 1930, there occurred a serious fight in Khartoum Province between charcoal-burners and graziers, the latter maddened by the continual cutting of the scrubby trees on which their flocks browsed. This was in the depression of the early 1930s, but it resulted in the appointment of one extra forestry inspector. The first measure taken was to remove the charcoal-burners *en bloc* to the country south of the new railway between Sennar and Gedaref, which took some of the pressure off the remaining desert trees in Khartoum Province.

Sawmills are, in most countries, owned and operated by private enterprise, but the long and costly haul from the south to the market of the north failed to attract anyone, and so the Forest Department had to start up a sawmilling industry. A start was made in 1930 near Wau producing mahogany timber for furniture. The next step was to set up sawmills in the *sunot* forests of the Blue Nile to supply Sudan Railways with their requirements of railway sleepers, and this was accomplished before World War II.

In the mid-1930s a curious discovery was that mesquite trees were beginning to appear in ones and twos on the heavily-grazed land between Khartoum North and Shambat. What had happened was that the herds of town goats from Khartoum North had discovered the pods on the trees along the Shambat fences and that the seeds, having passed through the animals, were being scattered over the land and were germinating when rain had fallen. The foliage, being bitter, was left by the goats so that the mesquite was able to spread. A tree which could do this in an area which receives less than seven inches of rain in the year seemed the answer to our prayers, and a lot of research into the cultivation of the tree followed. We had some difficulty at first in getting the very hard seed to germinate, and I remember very well my surprise when I discovered that fifteen minutes of stirring in concentrated sulphuric acid were needed to soften the seeds to the same degree as it accomplished by their passing through a goat. There were some disappointments - mesquite turned out to be rather choosy in its choice of sites - but I was greatly heartened on my last visit to the Sudan to hear that the tree was appearing in many places where every other tree had been browsed out of existence.

The publication of the Forest Ordinance in 1932 enabled land to be set aside in which felling and replanting of trees could be concentrated, with the object of reducing the pressure on the surrounding unprotected forest. Some progress was made before the outbreak World War II in creating these forest reserves, especially in the basin forests adjoining the Blue Nile and its tributaries, but preoccupation with the war-time need for timber and fuel held up further preservation until 1946. Recruitment and training of foresters, and the availability of District Commissioners for the land settlement work entailed now enabled the creation of these reserves to be speeded up, so that by 1955 the Sudan possessed a forest estate of over 1000 square miles - small indeed in comparison with the production of timber and fuel but also necessary for the protection which forests can afford to the soil and water supplies.

LIVESTOCK DEVELOPMENT IN THE SUDAN, 1899-1956

Waldo Glanville

In the Sudan so many people were dependent on animals for their livelihood that livestock was an important factor in economic development. On the establishment of the Anglo-Egyptian Condominium, the government was dependent on the use of riding and baggage animals for mobility and communications. At the same time it was appreciated that the potential wealth of the country's herds and flocks, whose numbers had been depleted by outbreaks of disease and general disorder prior to 1898, should be conserved and utilised to the benefit of the people and the economic advantage of the country. Controlling outbreaks of contagious diseases was not easy where the apprehension of the people rendered preventive measures difficult to apply. However, it was not long before sufficient control of disease was achieved to enable an export trade in livestock to be built up, and 1904 saw the beginning of a trade in cattle and sheep to Egypt. (By 1913 the value of the trade was £E218,300 compared with £E40,800 in 1909.) and the export cattle trade reached second place in the country's exports. Restrictions imposed by Egypt against the introduction of diseases limited the numbers that could be exported. All cattle had to be delivered direct to abattoirs for immediate slaughter. Immunisation against cattle plague (rinderpest) and contagious bovine pleuro-pneumonia, the two most serious diseases, was carried out and the Sudan established a series of quarantine parks on the export routes, where the animals were detained for specific periods. Another factor limiting the number of animals exported was the difficulty of obtaining a year-round supply of suitable cattle. The majority of export cattle came from the pastoral areas of the western provinces and were at their best bodily condition during the period August to December. From January to April suitable cattle were obtainable from the northern riverain areas. From May to July the only cattle suitable for export were those of the southern provinces, but efforts to establish a regular trade met with little success owing to the owners' unwillingness to part with their animals.

Egypt could obtain better quality cattle from adjacent Mediterranean countries up to the outbreak of World War I, but during the war demand for Sudanese cattle greatly increased to meet civilian and military needs. In 1918 some 40,000 cattle and over 200,000 sheep - about the limit the railways could carry - were exported. The world economic depression in 1929 resulted in a large decrease in the numbers of animals exported, and it was not until the outbreak of World War II, when supplies of meat from Europe to Egypt were curtailed,

that exports from the Sudan again increased. During the period 1942-1946 approximately 183,000 cattle, valued at more than £E1.75 million, and over 500,000 sheep, valued at almost £E2 million, were exported to Egypt.

Another very important export trade to Egypt, from the early years of the Condominium, was that of camels. No accurate records of numbers or value are obtainable since they were driven overland and did not pass through quarantines or customs posts. Permits were issued for certain desert routes and most of the camels exported were fat females for slaughter in Upper Egypt. The numbers exported were considerable - for example, in 1949 it was estimated that 78,000, valued at almost £E2 million, left the Sudan for Egypt. The early 1950s saw the beginning of an export trade, mainly of sheep to Saudi Arabia via Port Sudan and Jeddah.

In addition to the export of live animals, the export trade in livestock products, chiefly hides and skins, was of economic importance. Most Sudan hides were of poor quality, mainly coming from animals which had died of disease or exhaustion, but there was a market for such hides in Egypt. In the mid-1930s, when there was an increase in world hide prices, strenuous efforts were made to improve the quality of hides by better methods of flaying and preparation. In 1951 hide exports totalled 5319 tons, valued at £E124,814. Egypt, the UK, Sweden and Greece were the principal importers. The sheep and goat skins exported were of high quality, being mainly from slaughtered animals and usually dry salted. In 1951 sheepskin exports totalled 1898 tons valued at £E392,837. The USA was the principal importer of 324 tons of goat skins, valued at £E95,589.

Information regarding the animal population and its potential value to the country was steadily accumulated. It was impossible even to estimate with any degree of accuracy the number of livestock present in the Sudan. Herd tax figures, the number of animals presented for slaughter and at markets for internal and external sale that gave some indication of the size of the animal population. In the northern Sudan, Darfur and Kordofan Provinces carried by far the greatest number of cattle, while it was estimated that the numbers of sheep and goats were high in the Blue Nile Province. The density of the camel population was highest in Kordofan and Kassala Provinces. In the three provinces of the southern Sudan (Upper Nile, Bahr el-Ghazal and Equatoria) cattle numbers must almost have equalled those of the northern Sudan, but it was estimated that sheep and goat numbers were less than half. An estimate for the whole of the country made in the early 1950s was: sheep - 6 million, goats - 5 million, cattle - 4.75 million, and camels - over 1 million.

Most of the livestock owners were from the Arab nomadic tribes of the northern Sudan and the semi-nomadic tribes of the South, but a significant number of animals were kept by sedentary people living along the banks of the Nile in the North. The Arab nomads were dependent on livestock to supply

their nutritional demands for meat (fresh or dried) and milk, while the sale of livestock and livestock products met their cash needs. Milk was made into clarified butter, camel and sheep-hair made into rugs, hides provided leather for saddlery, sheep and goat skins were made into containers which were used as water carriers or churns, and sheepskins were used in the manufacture of saddle cloths. Cattle, camels, horses and donkeys were used for transport. In the southern Sudan cattle played an essential role in the social life of the Nilotic tribes, being currency and used for payment of bride prices and blood money. There was a reluctance to sell and cattle were slaughtered only as a sacrifice. Their meat demands were met mainly from animals that had died of disease and from wild game animals. Milk was a staple article of diet and fresh blood was at times mixed with it to enhance its value. Cattle manure was dried and then burned to provide smoke screens which helped to ward off the ever-present menace of biting insects while cattle were tethered at night and early morning. Cattle were considered too sacred to be subjected to the indignity of being used for transport or work. In the riverain settled areas of the northern Sudan animals played an important economic role in the life of the community. From the earliest times, the water required for irrigation of agricultural land along the Nile was lifted by water wheels driven by oxen and, although mechanical pumps gradually replaced them, the familiar nostalgic sound of the turning water wheel was heard in many places up to the end of the period under review. Camels were used in the turning of presses for the extraction of oil from sesame seed in some areas. However, the predominant economic role played by working animals was their utilisation for land cultivation and for transport. Ox-drawn implements were used for tillage purposes in the riverain areas and at one time over 4000 oxen were used for ploughing and ridging by the Sudan Plantations Syndicate in the Gezira scheme.

A large number of animals, mainly horses and camels, were required for mounting military units, the police as well as government officials, and a lesser number, mainly camels and mules, were required as baggagers. During World War II the demand for transport animals increased.

The civilian population used donkeys more than any other animal for transport purposes throughout the northern Sudan and in some parts of the southern Sudan (for example in the Torit District of Equatoria Province). Officially, loads were restricted to 150 pounds, but private owners often exceeded this weight when transporting produce and goods to market or railhead. In areas of the northern Sudan where heavier loads had to be transported, the baggage camel fulfilled an essential role. The camel was capable of carrying loads of 600 pounds or more over hundreds of miles and could be watered at much lesser intervals than the donkey. Mules were used by the government as pack animals as well as being employed occasionally by mounted police. Although less useful than the camel in desert conditions they could

be used in parts of the southern Sudan where muddy and hilly conditions precluded the use of camels. Loads of about 160 pounds were carried at a faster pace than that of the camel or donkey. In the main towns of the northern Sudan a smaller number of draught animals were used, the horse for drawing gharries and small carts and the camel or bullock for sanitary vehicles. Mechanical transport gradually reduced the need for animals in this sphere but animals remained the sole means of transport for a large number of people.

From early on it was realised that the indigenous types of domestic animals were well adapted to the conditions under which they had to live, and possessed potential for improvement where a year-round supply of adequate food and water could be ensured. In 1907 a small dairy farm was established by the government in Khartoum North. By crossing native cows with imported bulls of various breeds, such as Shorthorn, Devon, Ayrshire and Friesian, it was found that the milk yields of the crossbreds were substantially higher than that of native cows. The dairy was expanded gradually until it was able to supply the fresh dairy produce requirements of the then relatively small official population of Khartoum, Khartoum North and Omdurman. In 1929 with a herd of 50, including half- and quarter-bred crosses and native cows, almost 13,000 gallons of milk, over 300 gallons of cream and over 3,000 pounds of butter were produced. The farm, now known as the Belgravia Dairy, was sold in 1932 and under private ownership had by 1955 expanded to produce an average of 500 gallons of milk daily from 485 Friesian/Native cows, of which about 260 were in milk at any one time. Individual cows produced as much as 1300 gallons in a lactation.

Small government dairies were established in many parts of the country, usually province or district headquarters, and provided officials and others with milk which in many cases was unobtainable from alternative sources. The proper management of most of these small dairies was impossible; but at the Gezira Research Farm, Wad Medani and at the farm of the Faculty of Agriculture, Shambat, it was demonstrated that selected indigenous Kenana and Butana cows were capable of producing high milk yields and that the normal lactation period could be prolonged. The average daily production per head was 1.5 - 2 gallons and some individual cows produced over 700 gallons in a lactation of 10 months.

The milk yield and the length of the lactation period of the cows kept by the pastoral and semi-pastoral owner varied greatly and were dependent on the availability of grazing and water. The milk of the Sudan cow is of very good quality and is rich in butter fat. The Desert Sheep, the commonest type in the Sudan, was an important source of milk and produced up to six pints daily under good grazing conditions. The Nubian Goat was capable of milk yields as high as the Desert Sheep if supplementary feeding was provided. Camel milk, low in butter fat compared to that of the cow, was frequently the only liquid

available for consumption when camel owners migrated with their herds to waterless regions in search of grazing and browsing. The daily yield was one to two gallons in addition to that allowed to the suckling calf.

Efforts were made in the early years to improve the indigenous types of horses by the introduction of imported thoroughbred and Arab stallions. The first thoroughbred was presented by Lord Kitchener. The thoroughbred crossed with a mare of good conformation produced a horse with size, shape and racing capabilities but it required special care and attention and a liberal diet to reach maturity. It was a luxury horse but there was a demand, by Sudanese and non-Sudanese, for such an animal in towns like Khartoum, Omdurman and Wad Medani, where the chance of winning on the race track and the glory of ownership was the main incentive. There are records of horse racing in Khartoum since 1909. Experience showed that the pure bred desert Arab was the stallion most capable of correcting conformation faults and improving native stock, producing foals with stamina and capable of withstanding the natural conditions of hardship to which the vast majority of horses in the country were subjected. In the pastoral areas, owners were at first suspicious of government interference and were unwilling to bring their mares for service by imported stallions, but in 1910 it was possible at Abu Zabad in Kordofan Province to arrange a gathering of some 2000 horses of the Mesiriya tribe and make available the services of imported sires. This horse show became an annual event. Since 1918, a year after Darfur was taken over, seven or eight shows have been held annually at places convenient to the horse-owning tribes of Kordofan and Darfur. Some 16,000 horses annually attended these shows.

It was considered that the best areas for horse improvement, under natural conditions, were south-central Darfur and parts of south Kordofan and it was here in 1925 that a scheme was inaugurated with the object of producing an animal of improved type which would provide suitable remounts for the army and police. It was hoped eventually that the native type horse would be so improved that the use of imported sires would not be necessary. The best mares of each tribe were selected, registered and tattooed and the owners instructed to mate them with government or approved tribal stallions. Each sire was given a letter of the alphabet and the resulting foals were tattooed with the letter denoting their sire. Tattooed mares and foals were exempted from herd tax. The scheme received the whole-hearted support of the tribal authorities and provincial administrative officers. By 1926 some 900 mares had been registered and by the following year this number had increased to the 1000 aimed at to put the scheme on a sound footing. The number of stallions was increased gradually and in 1929 there were 25, mostly Arab, stationed in Darfur. Although the scheme resulted in improvement of the local stock it was soon realised that many of the progeny of the imported sires were too good for the type of country and the way of life which they were forced to lead with their nomadic owners.

There is no doubt that although the scheme was not an unqualified success valuable information was gained and, most of all, the annual horse shows in connection with the scheme in Darfur assisted in winning the confidence of the people in a province which had recently come under the control of the government. The use of imported sires was discontinued later and the policy of using selected country-bred stallions made it possible to satisfy all the official demands for suitable horse remounts.

Figures of animals slaughtered in the main towns were kept from the earliest days and gave an indication of the meat demands in some of the urban areas (212,425 sheep, 58,697 cattle, 28,227 goats and 2,136 camels were slaughtered in the principal towns in 1951). Although meat was available to most of the populace, there was a large area in the southern Sudan infested with tsetse fly where animals could not be kept and meat from domestic livestock was unavailable. Attempts to move cattle from non-tsetse areas for slaughter in the flybelt demonstrated that it was an uneconomic proposition on account of losses suffered en route from trypanosomiasis. However, the use of antrycide proved that if cattle were injected prior to departure it was possible to move them into the flybelt without losses. In 1950 some 2000 slaughter cattle so treated were transferred on the hoof.

The setting up of the Soil Conservation Board of Economics and Trade in 1946 were two factors which were to have an important influence on the economic development of the Sudan. The former was concerned with soil erosion problems caused by animals and with the provision of improved water supplies. As a result a large number of deep bore wells were sunk and earthen storage tanks built, allowing animals to remain longer on their grazing grounds and permitting them to reach markets along routes which would otherwise have been denied them due to lack of water. The Livestock and Veterinary Policy Committee, consisting of the Director Economics and Trade (Chairman), Director Agriculture and Forests, Director Veterinary Service and a representative of the Civil Secretary, was given terms of reference which included the study of the livestock problems of the country and making suggestions for the future policy (including animal husbandry and dairying), as well as the apportionment of departmental responsibility in the implementation of that policy.

It appeared to the Committee at the outset that the framing of future policy towards the maintenance or increase of the animal population must be conditioned by demand (internal and external) and supply (which depended principally on the availability of means of subsistence - pasture and water - and on disease control and stock improvement). The dietetic needs of the internal population alone necessitated an increase in the consumption of animal products and demand was likely to increase in the external market. The fact that it was impossible to estimate with any degree of accuracy the numbers of livestock in the country, and that in many places information was lacking in

regard to the availability of grazing and water, which varied from year to year, made it difficult for the Committee to decide whether or not an increase of livestock was desirable. Another factor that had to be considered was the effect of disease control on animal numbers. As regards dairying, the Committee agreed that important work had been carried out at Wad Medani and Shambat with selected indigenous stock. It was agreed that this should continue but that there was a need for general direction of policy, and encouragement in better dairying by affording advice and practical help. Although it was advisable that dairies should be operated by private enterprise it was felt that local authorities might, initially, undertake the provision of adequate local milk supplies from dairies which could later be handed over to private enterprise.

With regard to stock improvement, it was noted that probably 80 per cent of the country's cattle were owned by pastorals and that better grazing and watering and disease control, all contributing to survival capacity, were of more immediate importance than stock improvement. However, it was agreed that the appointment of an animal geneticist was desirable for work in connection with milk and meat production. A permanent organisation for the compulsory grading and marking of export hides would lead to hide improvement. There was little immediate danger of overstocking provided water supplies were increased but it was desirable that a pasture expert should be appointed to investigate the grazing resources.

It was agreed the control of livestock numbers by disease should not be accepted as good policy. Up to this time, a limited amount of prophylactics had been available for disease control, used mainly to prevent violent numerical fluctuations. The Committee now recommended the introduction of a system of mass immunisation, province by province, in controlled stages. Systematic immunisation would facilitate the making of a census and thus contribute to the amassing of data upon which the question of the country's stock-bearing capacity and consequent long-term livestock policy, could be resolved. The Committee agreed that a policy of fattening cattle for export on the hoof was unlikely to be economical in present circumstances but that as a policy of full immunisation took effect, there should be sufficient cattle not only to maintain the present export trade and to meet increased local demand but to provide a surplus for processing either by canning or refrigeration. As a result, mass immunisation against cattle plague began in 1947 in Darfur Province and continued yearly until a total of between 300,000 and 400,000 head of cattle had been immunised in cattle-producing provinces and by 1950 there was an organisation in being in each province capable of controlling cattle plague. Although in most years cattle plague was responsible for the greatest losses, contagious bovine pleuro-pneumonia was another disease causing many deaths. Mass vaccination, in some years totalling over one million doses, was carried out in an attempt to reduce the incidence of the disease.

Trypanosomiasis, outside the tsetse belt, was not responsible for heavy losses among cattle in a normal year, but in late 1946, following a season of heavy rains with a consequent increase of biting flies which spread the disease, severe losses were occurring in the southern Sudan. Early in 1947, when dimidium bromide proved to be effective in controlling the disease, a large-scale inoculation campaign was carried out. In the Upper Nile Province alone some 300,000 head were inoculated. Antrycide, which was discovered shortly afterwards, was subsequently used and many hundreds of thousands of cattle were successfully treated during the next few years. There was little likelihood of outbreaks of trypanosomiasis ever again assuming epidemic proportions.

A survey of all the grazing areas of the country, begun in 1947 with the appointment of a pasture research officer, was completed in 1953. The appointment in 1947 of an inspector of hides led to further improvement in the preparation of hides and skins and to the establishment of a central grading depot at Omdurman. The building of a private enterprise meat processing factory at Kosti was completed in 1952. A tsetse survey and reclamation team was created in 1951 at Khartoum North. Eggs of various European breeds of poultry were hatched out with the object of assessing the suitability of such stock in the northern Sudan and comparing them with indigenous types of poultry. The animal research officer, appointed in 1952, toured most of the livestock-rearing areas and made a detailed survey of Kenana cattle in anticipation of the establishment of a livestock improvement and animal industry centre in the Fung District of Blue Nile Province.

These were some of the results arising out of the recommendations of the Livestock and Veterinary Policy Committee. It had become obvious that the animal industry was only beginning to emerge from the first stage of its development and that much more research was needed before further development could be attained.

THE PRIVATE COMMERCIAL SECTOR

K. C. Keymer

It is rightly claimed that the private commercial sector, with great enterprise and risk-taking, provided expertise, technicians, large quantities of capital equipment supported by stocks and vital spares, and a heavy contribution in capital. Without those companies and banks the planning by government in the Sudan would have been far less fruitful, and development much slower.

We have the centenary volume *Gellatly's, 1862-1962*.¹ By citing the history of Sudan Mercantile I am giving a picture of the general contribution by the private sector. Fortunately we have a comprehensive record for the company. More than 40 years ago I turned the old archives into an early history, and then continued it with the personal knowledge from my brother Ronald's involvement and my own. Following the death of our father, Sir Daniel T. Keymer OBE in 1933, we continued his devotion to the Sudan work.

Sudan Mercantile opened in Port Sudan in 1905. Judging from some pictures of that period I have often wondered about the conditions there for the first Manager. The company started over-optimistically with their own considerable engineering workshop and ice and mineral water plants. By 1912 all this had come to nothing and the money had been lost due to inadequate management on the spot, whilst Port Sudan had not developed as quickly as had been anticipated. Meanwhile our family's merchant house, Keymer, Son and Co., had become Managing Agents of Sudan Mercantile. In 1912 Daniel Keymer visited the Sudan. He formed the faith in the future that was to be the driving force for the organisation, and he purchased the ownership of what remained of the original company. An office was opened in Khartoum in 1913, but the low ebb of the company and World War I postponed any real development until 1920. Our outstanding managers then came on the scene, starting with Mr J. Seath, and progress became continuous.

The claims on finance were correspondingly heavy, and were the more onerous because of the whole financial weight on Keymer, Son and Co. after the War. For 1923 there is a report that £24,563 was due to London from the Sudan - a figure to be assessed at the money value of that time. In fact no money came homewards from Sudan Mercantile through the 33 years from its inception until 1938, and after that dividends were always kept low to assist development. Sir Daniel Keymer had seen the working-out of his faith, but not a penny in return during his lifetime.

A branch was opened on 1 January 1926 in Wad Medani. In 1929 there came into being the five Companies registered in the Sudan:- Sudan Mercantile

Co. (Khartoum) Ltd., Sudan Mercantile Co. (Engineers) Ltd., Sudan Mercantile Co. (Motors) Ltd., Sudan Mercantile Co. (Port Sudan) Ltd., Sudan Mercantile Co. (Wad Medani) Ltd.

As well as general trading, the organisation had developed into experienced contracting engineers. The records tell of Kitiab pumping station in 1927 and Lalud pumping station in 1928, and the contract from the Sudan government for a new ginning factory at Kadugli, Nuba Mountains Province. The particularly important Port Sudan ginning factory followed in 1930-1931, and then four further ginning factories for the Nuba Mountains area.

Another outstanding contract (1934) was for the Mezagila low lift pumping station - three Ruston engines driving three Gill axial-flow pumps each delivering about three-and-a-half tons of water per second - which replaced the old Hag Abdulla Station and served an area two-and-a-half times as large. In 1936 there was a valued contract from Sir Sayed Abdel Rahman El Mahdi for four pumping stations on the White Nile.

With 'Motors' Company the Ford distributorship had developed well in automobiles and trucks, including considerable supplies to the Sudan Defence Force and the Public Works Department, and in due course Ford tractors made their contribution to agriculture.

Thus the 1930s set the picture for the development of the Sudan Mercantile Group. World War II saw my brother and me in the Army and Navy respectively, with the Sudan work going ahead regardless. On his return from the Eastern sphere, Ronald went to the Sudan in 1946 and in 1950 became Managing Director of the Group - a valuable contribution including his happy relations with many Sudanese; his retirement from the Sudan in 1963 carries us beyond the time of the Condominium.

From our history for 1951, *Faith in the future*, the following is worth quoting:

The rapid Sudanisation, the tightness of cash and the wish in London for funds to be held outside the Sudan all became matters of special preoccupation, particularly remembering the recent debacle at Abadan in Persia.

Mr K. C. Keymer made a special and useful visit of one week to Khartoum in November to study and discuss these matters on the spot. His report records the pleasure in seeing the development and high morale showing in all directions in the Sudan Companies, and the outstanding satisfaction in hearing from several senior Sudan Government Officials quite unsolicited expressions of opinion as to the high reputation of the Companies and their contribution to the Sudan's development.

Independence came to the Sudan on 1 January 1956; thereafter the private commercial companies and banks carried the flag until their sudden nationalisation in May 1970 - more than fourteen years of further contribution amid increasing difficulties.

Notes

1. Blake, G., *Gellatly's 1862-1962: A short history of the firm* (London; Glasgow, 1962).

Appendix

From Report to Shareholders in London on 2 October 1951 - larger orders obtained by Sudan Mercantile during the previous 12 months.

Modernisation of No. 2 ginning factory for SGB.
Modernisation of No. 1 ginning factory for SGB.
Wiring & lighting (fluorescent) for eight ginning factories for SGB.
Asbestos cement piping & connections for fire mains for SGB.
61 Braithwaite pressed steel tanks for water for SGB.
Kassab pumping plant for El Sayed Sir Ali El Mirghanl Pasha KCMG, KCVO.
Ruston locomotive 100 DL for the Sudan Portland Cement Co. Ltd, Atbara.
Ruston locomotive for Sudan Irrigation Dept.
Ruston engines and B.T.H. alternators for El Obeid power station extension for PWD.
9 more Ruston/B.T.H. alternator sets for PWD.
Sumo Submersible Pumps for PWD.
200 small Braithwaite pressed steel tanks for PWD.
2 Ruston marine engines for Steamers Section, Sudan Railways
Crittall windows for new Khartoum Civil Hospital
4 Ruston-Bucyrus and 5 Bucyrus-Erie dragline excavators for Sudan Irrigation Dept.

THE JONGLEI AND SOUTHERN DEVELOPMENT INVESTIGATION TEAM

Paul Howell

Alan McCall has referred very briefly to the Nzara Scheme among the Azande (a Scheme on which I might have fairly divergent views) and at the end of his introductory remarks mentioned the significance of the Jonglei Scheme. As Chairman of the Jonglei and Southern Development Investigation Team, I should like to report on the latest position. The Jonglei Canal project is only a part of the original Equatorial Nile project.

The canal under construction will have regulator works at the head designed to switch discharges in varying amounts down the canal and down the natural channels of the Bahr el-Jebel. But for the time being there are no control works upstream - such as a balancing reservoir below the torrents of the Nimule/Juba reach or dam and storage capacity in Lake Albert. Control exists at the Owen Falls dam in Uganda, but storage in Lake Victoria is strictly limited, and governed by international agreement.

The High Aswan dam and the reservoir behind it have long since meant that there is no uncontrolled wastage of water flowing into the Mediterranean. Moreover, water can be held back in the Aswan reservoir and distributed in accordance with Egyptian seasonal irrigation needs. Hence there is no longer the need for seasonal variations in discharge from the Great Lakes to meet downstream irrigation requirements - the 'timely' and 'untimely' seasons as they were called. It follows that the main and most adverse local hydrological effects in the southern Sudan under the original Equatorial Nile project - the reversal of the seasons which meant high river levels in the dry season and low levels in the rains and consequently dramatic ecological changes - will not take place.

The canal now under construction is much smaller than the canal designed for the Equatorial Nile project (20 million cubic metres per day in capacity as compared with 55 million cubic metres). The canal will be 360 km in length, of which approximately 100 kms have been excavated to date.

The sequence of very high White Nile discharges of the mid-1960s followed by discharges only marginally less in the mid-70s, and consequent accumulation of water in the Great Lakes have meant unprecedented levels of inundation in the Sudd region, much greater even than the floods of 1917, or *Pilual* as the Nuer call that disastrous year, and much longer sustained. Comparisons of recently prepared vegetation maps with maps produced by us

in the 1940s and '50s and personal knowledge of areas we used to traverse on foot quite easily in the dry season indicate much greater areas of land permanently under water. The changes are dramatic.

Since this is so, the siphoning off of some of the excess water normally lost by evaporation and transpiration in the swamp through the canal can do little but good, provided that recent hydrological conditions (say the mean of the years 1965-1975) continue. Levels will be lowered by the additional run-off through the canal and what is now permanent swamp may return to *toich* grasses of value as grazing during the dry season. Indeed conditions might return roughly to those prevailing between 1945 and 1955 when the original Jonglei Investigation was undertaken. Thus far, criticism of the present project is not necessarily justified and anxieties among some Southerners (which at times have led to disturbances) may be ill-founded.

But there are causes for anxiety nonetheless. What happens in a series of exceptionally low years? Will this simply mean that papyrus swamp will quickly vanish and be replaced by seasonally inundated grazing grasses such as *Vossia* and *Echinochloa* species compensating for increased areas of relatively valueless 'intermediate' grasses - e.g. *Hyparrhenia* species farther up the almost imperceptible incline which characterises this area? Or will there be a marked diminution of grazing resources and hence a heavy reduction of carrying capacity for animal stock in the area?

More critical perhaps is the lack of knowledge of what may happen if, for example, a series of very high annual discharges - necessitating maximum flows down both the canal and the natural channels - coincide with very high rainfall in the Sobat catchment and hence very high levels of discharge at the Sobat mouth. In such circumstances, without storage upstream or any means of flood control, there could not only be substantial back-up effects up the Zeraf River and the Bahr el-Jebel, but possibly calamitous downstream flooding among the Shilluk, Dugol and Paloich Dinka, and even farther downstream a pump scheme along the White Nile.

There are otherwise costs and benefits which can be assessed both quantitatively and qualitatively, and adverse effects can be balanced by what we called 'remedial measures' but which are synonymous with resettlement and other forms of development scheme. It is worth mentioning in parenthesis that during the whole of the seven years of the Jonglei Investigation we were not allowed to examine development potential - only to assess the effects and to suggest the remedies rather than development projects, though the distinction is not apparent. (Development potential only came within our terms of reference when, after considerable inter-departmental struggle, the Southern Development Investigation Team was established.)

The principal drawbacks of the present project are the difficulties of seasonal migration of population and livestock westwards to seek dry-season

pastures since movement will be obstructed by the canal. This problem, however, is largely to be solved by the new alignment of the canal along a line mainly, though not entirely, on the eastern side of the permanent settlements of the Nuer and Dinka of that area, and also by the provision of five bridges and eleven ferry crossing places.

Conservationists are concerned about the east-west game migrations (principally Tiang). This may be partly assisted by less steep slopes now included in the design of the banks of the canal, and important though game conservation may be, these animals have never played a significant part in the subsistence economy of the area. Nuer and Dinka are not particularly energetic hunters except in time of acute food shortages.

The hydrological effects still need to be determined more precisely by the use of a mathematical model of the kind advocated by Dr John Sutcliffe, but ecological effects are under competent investigation by teams of experts of a high order with the advantages of modern technological methods not available and, indeed, undreamed of in our day. The information and data amassed in the days of the Jonglei Team have nonetheless been the basis of all subsequent investigation and those currently engaged in this work would be the first to acknowledge it. Our investigations, carried out over seven years in pretty arduous and daunting physical conditions, were conducted at an infinitesimal fraction of the cost of present-day work even in real terms.

Our successors in the field would be astonished to know that the Chairman of the Jonglei Development Committee at one time accused us of 'unreasonable and extravagant demands' (probably a demand for a replacement Land Rover or even a typist) and was anxious that our efforts should be terminated abruptly and without adequate time to analyse the massive data accumulated over the years. The Jonglei Report¹ was produced nonetheless, and while meeting our terms of reference to suggest alternative likelihood remedies and their cost, and in the event to propose an alternative hydrological regime to reduce the adverse effects to a minimum, the main aim in our minds in the very rushed circumstances was to record as effectively as possible, in the very limited time still available to us, as much as we could of the basic data on which our conclusions had been reached. The value of this decision can only be judged in the light of the work which has been undertaken since then, and also the brief report on development potential in the South which had to be completed after only five months in the field.²

Notes

1. *The Equatorial Nile Project and its effects in the Anglo-Egyptian Sudan* (6 volumes) (1954).

2. Natural resources and development potential in the Southern Provinces of the Sudan (1954).

IN DISCUSSION - ECONOMIC DEVELOPMENT

Chairman: Sir John Carmichael.

Alan McCall: Dr Tothill suggested that the success or failure of the Zande experiment could only be judged after at least 30 years. It had certainly not failed when it had to be halted in 1955 but, in retrospect I believe, the resettlement program which attempted to regiment people into individual farms with fixed boundaries was a mistake. It was a bold attempt to modify the system of agriculture to make supervision of farming easier, but adequate research had not preceded it. Another development which was still in its early stages in 1955 was mechanised farming in the central rainlands. These clay plains constitute one of the most valuable reserves of undeveloped land in Africa and the Middle East and their economic development will not be easy.

'Jumbo' Wakefield (1929-1955): In my first years about 1930 I happened to meet a young ADC and he picked out of his pocket a handkerchief map and said, 'I wonder if you could sell me some more of these, because I find that their only use is as handkerchiefs and I can't buy such good material in the souk at this price.' I feel this indicated the attitude of the administration to the necessity of a survey. Luckily in the mid-1930s outside interference and world opinion forced the government to allocate money for maps of riverain land, and a basic structural survey of the Sudan was initiated.

John Wright (1939-1955): I wonder if I could just give an idea of what surveys actually do for a project like the Zande Scheme? It was quite typical of the sort of project that, after I left the Sudan and worked in a commercial company and then in the directorate of overseas surveys for the Ministry of Development, we were doing for developing countries all over the world. There were three maps that we had to produce. I was sent down there for five or six months and was asked to produce large-scale contoured maps of the Yambio and the Nzara areas. I did this with the help of two Sudanese surveyors and chainmen. Fairly early on it occurred to me that another other sort of map was probably required: a general map of the whole area. All we had was the quarter-million which was largely compiled by Major Larkin from talking to the Zandes and a few compass bearings. It was quite remarkably accurate, with all the names of the rivers and so on, but we could do better than that - the first aerial survey ever carried out in the Sudan. The photography was done by a bomber squadron in Khartoum who were allowed to take photographs. (They ended up with a rather odd system in which the strips were separated by strips which they had not covered.) We produced a sort of map and patched it together on about 50,000. Then the third type of map was one that Alan McCall made on probably 10,000 scale

corresponding to the British six-inch. This concerned the 250,000 resettled people in the Zande scheme. They were all along straight lines which were cut through the bush and along which 'Tiger' Wylde apportioned them villages.

Mohammed Omer Beshir: I have just seen a PhD on economic development in the South called 'The policy of negligence'. How would you assess this policy of negligence? Secondly, how would you assess the policy of the Condominium towards qualified manpower and education? I would say the years of the Condominium did not give education for leadership, for planning. I think, hence the failures.

Sir John Carmichael: We were always very hard pressed for money until after the war. Before that we had to live from year to year. We have been accused of not borrowing. Well, the Sudan owed some 30 million pounds, between the money raised in Britain and in Egypt. Who outside was going to lend money to a country already in debt to 30 million that had a budget that was balanced at five million? We had given priority to the Gezira Scheme, in the hope that it would be fruitful immediately and therefore there would be more money to spread more widely on economic development and the expansion of the services. But the Gezira Scheme took much longer to make the contribution to the country than we had hoped.

Alleyne Nicholson (1923-1949): One of the problems, of course, was that we were trying to impose this on a peasant economy. I got to know the Gezira from the inside very well. Now, the tenants had 10 acres of cotton, which they got their share of the price. They had free water for 10 acres of millet. They had to work on it with their families, but it was a guaranteed food supply, far more than they needed themselves. Again, they had up to two acres if they wanted it, for two pounds an acre rent, to grow beans or vegetables for the animals or to sell in the market. If I saw a plot there with good cotton, good dura and vegetables I would ask, 'Where do you come from?' 'Oh, I come from Shendi', 'I come from Merowe', 'I come from Khartoum North'. Now these were the people who knew how to farm - the people who worked on the *sagas* in the old days. They knew how to look after the land, how to cultivate it, and how to fertilise it, within limits.

George Bredin (1921-1948): The Gezira Scheme was undoubtedly the greatest asset that was bequeathed by the Condominium government to the independent Sudan. We should say something about the impact of the Scheme on the social and economic side of its 20-odd thousand tenants. And this is best illustrated by the extraordinary incident of the tenants' strike. Sir John Carmichael told us about the lean years of 1930-1932 over which the Syndicate, the government and the tenants all went heavily into the red. And the government and the Syndicate decided when better times came that something must be done to prevent this recurring: a reserve fund must be created, not only for the two senior partners but for the tenants. Every tenant's agreement had a clause added to it

allowing the senior partners in a good year to withhold a part of the tenant's share of the profit and pay it into a reserve fund which could be used to reinforce their income in difficult days. Well, this went on until better days came after the war. The tenants suddenly realised that they had a reserve fund to their credit of a million pounds. The effect of this, I think, could be predicted: they wanted to spend it. And in the most extraordinary simultaneous way the demand came from all over the Gezira - 'We want our money! This is our money, you yourself agree that it is. We want it now! or else we plant no cotton.' Well, clearly it was most uneconomic to pay anything out when there were no goods to be bought - sugar, cloth, everything was rationed - and we remonstrated. John Gaitskell (who was then in charge of Barakat) and I did our best to remonstrate with the parties of tenants who came to the *Mudiriyya* and to Barakat. It was all in vain. They said, 'No! no money, no cotton.' Well, we knew quite well what the impact on the economics of the Sudan would be if no cotton was sown, what in fact would be the effects on the future of the Sudan. And so Gaitskell and I decided to consult the Sudanese on whom the responsibility for future government would fall. At my request they came to Medani, they went round the Gezira looking at the conditions and we had a meeting in my house with John Gaitskell. A most revered member of our assembly, Dr Ali Bedri, was one of them. I said, 'What should we do?' They said, 'It is clearly folly to pay money out to tenants at such a time, foolish and uneconomic. But if you don't you will get no cotton and the Sudan will lose half its revenue for the year. We recommend that out of the million pounds you spend £400,000.' We persuaded the central government (the Financial Secretary as it was in those days) and the London office of the Plantations Syndicate, I think much against their will, that this must be done. £400,000 was paid out and work on sowing began immediately.

There was a lesson to be learned from this, and we learnt it. It was clear that we must bring the third partner more into our confidence. We must tell him more, we must consult him more. And we at once arranged for an elected body to be created from the Gezira tenants who would meet periodically in the *Mudiriyya* with whom the other two partners could discuss affairs that affected the three partners. That arrangement began at once, and you will be interested to hear that one of the first decisions that an early meeting this assembly made was that the £400,000 should be withheld from their next year's payments and be repaid at once into the reserve fund. And in the following year, which was also a good one, they agreed on their own that a million pounds should be withheld from the tenants' share and that the reserve fund should be doubled. I think that should go down on the record.

Alan Theobald: For a long time there was distrust of the educated classes. That attitude changed, luckily, I think with the coming of Mr Cox as Director of

Education in the late 1930s. From then onwards the need at last was realised that for a modern country which was aiming and progressing toward independence a large educated local class was essential.

Sirr Al-Khatim Al-Khalifa: It is important to emphasise the meagre resources available for the Condominium government. I think this ought to be granted, and we must bear this in mind all the time from the point of view of money, staff and other resources. But I think that there are certain aspects or sides of our development into which money doesn't come very much, and perhaps Sir John would have been nearer the point of solving some of our problems had he had the benefit of people like Dr Theobald who told them that the Gordon College was not running on the right lines. One secondary school: maybe the reason was financial, granted. But it could have done a better job had the aims of education been more clearly formulated and related to the future of the Sudan as an independent democratic country. Raising of the standard of living did not need all that money. It needed guidance, it needed mixing with the people, living together with the people, setting an example in rather small ways which would help people to develop. I remember in the South, the difference between the big schemes which cost a lot of money and the small scheme which was started by the Church Missionary Society in the Yei district in Ndokorewi, which didn't cost a lot of money but which had substantial results in the actual raising of the standards of living of the people.

G.W. Power (1925-1949): I happened to work through an undeveloped country in the construction of a railway from Kassala right through to Gedara and to the Dinda. For most of it we had several hundred *saidis* cutting away kittabush, and you could not see anything beyond the 20 metres from the centre line of the track. That finished in 1929. In 1949 shortly before I left the country I went on a trip round there to see what had happened, and there was no more kittabush. There were stations which were just crossing stations with good sheds, and thousands of people dwelling there.

Mr Seamer (1936-1955): My last two years were as Registrar of Cooperative Societies. In those days cooperative development was regarded as very important economically and socially and I am sad that there is not one single mention of cooperative development in your papers.

Part II:
COMMUNICATIONS

INTRODUCTION

Richard Hill

An unobtrusive quality in the men who administered the Anglo-Egyptian Condominium was their quiet ability to graft British concepts and practices on to the instructions of the preceding Ottoman-Egyptian government in the Sudan. The older branches of the Condominium civil service: river transport, railways, posts and telegraphs, can claim continuity with their Egyptian counterparts. By 1890 the Egyptian government was navigating on the two Niles a fleet of British-built paddle steamers whose battered survivors from the wars, with their ageing crews, faithfully served the early Condominium. On land the Egyptians maintained a modest railway depot at Wadi Halfa with 45 km of three-foot, six-inch gauge track round the Second Cataract. By 1880 the Egyptian telegraphs in the Sudan, a branch of the Egyptian State Railways, consisted of a network of land lines linking Cairo with Khartoum, Suakin, Massawa and the borders of Darfur, while the Egyptian postal service, with offices in all provincial centres in the northern and central Sudan, provided a regular service for mail to and from Egypt by steamer and camel courier. In these respects the policy-makers of the Condominium may be described as restorers and developers rather than as innovators; but in airways and modern telecommunications circumstances made them innovators.

The eleven hurried years of the handing-over of power between the end of World War II and the declaration of Sudanese independence were accompanied by continual development in communications. After independence the pace of technical change was accelerated with the extension of the railway to Darfur and the Bahr el-Ghazal. An oil pipe-line followed by a motor road connected Port Sudan with the Nile valley. The decision of the Egyptian government to build a great earth dam above Aswan without locks or ship incline arbitrarily closed the historic rail and steamer link between Khartoum and the Mediterranean. The withdrawal over the Nile cataracts to Khartoum of the best ships of the Sudan Railways fleet marooned by the rising waters upstream of the dam was a hard and successful exercise in river navigation. Unhappily the record is incomplete. Death and disablement have deprived us of any contribution on the Sudan posts and early telegraphs under the Condominium, a service which has almost no serious recorded history. For the same reason there is no paper from engineers of the Condominium Public Works Department.

Every public service worth its salt welcomes intelligent criticism and all in the Sudan communications business must have received and offered it. To give only a few examples: outsiders visiting Atbara have questioned the wisdom of

siting a vast technical ghetto in the wilds isolated from continuous contact with the rest of the country without regard for the psychological and social results on its inhabitants. The critics here forgot that the site had been decided in 1905 on logistic grounds by practical British bachelors when there was no nonsense about psychology. Port Sudan harbour officials in the writer's day were unhappy over the government's omission to exploit 'Aqiq with its large, if rather shallow, roadstead, its good potential fresh water supply and its possibilities of convenient railway access through the Red Sea hills at the Angwatiri Gap, as the Sudan's second port. A Sudanese businessman wondered why the Arabic language requirements for members of the Sudan Political Service, who dealt chiefly with rural grandees, were more exacting than for Sudan Railways British traffic officials who spent much of their lives among astute, sophisticated and highly literate Sudanese, Egyptian and Levantine commercial men. Labour relations, which involved all branches of communications, exercised the late Dr Saad ed Din Fawzi who blamed the British in general and Sudan Railways in particular for mishandling their relations with their Sudanese workforce.¹ Unfortunately labour troubles, relatively light under the Condominium, did not automatically disappear with changes of political regime, and labour relations were to embarrass successive governments after independence.

The handing-over of gigantic and often sensitive physical assets worth many millions of pounds consists not only in the conscientious passing on of managerial skills by the outgoing authority but the willingly receptive absorption by the receiving authority of fundamental industrial attitudes and techniques, prominent among them an aptitude for orderly, responsible planning and a continuous attention to the systematic maintenance of assets. To order new equipment is one thing, to maintain it is quite another. Six of the seven contributions which follow describe how the handing-over process was achieved.

Note

1. Fawzi, Saad ed Din, *The labour movement in the Sudan, 1946-55* (Oxford, 1957)

GENERAL TRANSPORT POLICY

Sir James Farquharson

I came to the Sudan as a newcomer in 1952 having served in East Africa from 1925. My predecessor was John Hillard who had been seconded from the Political Service. He warned me that it would take 50 per cent of my time to deal with the trade union. I expressed the view at the time that that was not acceptable to me, but perhaps 10-15 per cent was the more likely time I would devote to trade union activities. At departmental level there were six committees, each with about six members. The department committees together formed the main negotiating body. After they had cleared the air at departmental level I was asked to consider what they called 'the demands' - a list of about anything up to twenty items which they wished to discuss. One never got a reasoned case, simply a one-line advice of what was required. I do not know if this was happening in Geoffrey Power's time, but his successors, Reg Humm, Jimmy Kneale and latterly Muhammed El Laboudi were all familiar with this method of progressing. So we had these complicated rather protracted meetings, not without some humour and really not very much bitterness, but it did take a long time. I remember on one occasion, after we had been arguing back and forward on about 20 items, one of the committee got up and said 'You know, when Mr Hillard was here we used to make 20 demands and we'd progress on fifteen, now we put in 20 demands and make progress on two, and not very much progress at that.' So I said 'Well, the fact is the things which he considered were not right have been corrected. We work within the limits of what the Sudan economy can bear. There's no reason why railway workers shouldn't be well treated and indeed, treated rather better than most people, but nevertheless we must take account of the situation in the Sudan as a whole and as a responsible management. That is the most I can do.' So I think the final word was, 'Well, at least we've got our coffee out of the meeting!' The system seemed to work, though we had these occasional fixed period strikes; we used to have three-day, four-day, five-day strikes.

I will not say any more about the labour situation. The worry when I went to the Sudan was not that the standards of performance were not good: I thought they were very good indeed. The permanent way and works were well maintained, the overhaul of rolling stock and locomotives was efficiently performed and operating performance was good. We were, however, very short of statistics. I was always very much in favour, from the time I went into railway management, of having adequate statistics readily available so that one could keep one's finger on the pulse. So with the help of Derek Pickering and the Accounts Department, we evolved standard statistical and financial statements

to be produced at the end of every month, with the statistics that were necessary to see whether the department were doing their job effectively. If any department was falling below standard then I had to know the reason why. So I should say that at the time of independence the Sudan Railways was probably just as efficient a railway system (in terms of getting a high percentage of locomotives available, and getting a maximum mileage out of wagons, carriages and locomotives) as any railway in tropical Africa. Mekki el-Sayed Ali was the Operations Manager after independence: I know that through the two years I was there after independence the standards of operation remained very good indeed.

The change to diesel Steamers brought substantial benefits in the utilization of the fleet to the South. The old steamers did a turn-round in four weeks; we were able to switch it over to three weeks. This of course made much better use of resources and had the effect of virtually halving the substantial deficit. I had hoped that the remainder of the deficit would have disappeared if we had got rid of the Jur River service, but that was not possible at that time; this issue will be mentioned later. The standards of performance at Port Sudan, in my opinion, were very good, the effective factor being the rate at which goods can be transferred from ship to shore and from shore to ship. Port Sudan was as efficient as any other port in Africa.

A problem which worried me when I went there was that we had just had a very busy year, 1952, after the very high price for cotton caused by the Korean war. The traffic level had gone up to what appeared to be an enormous peak and everybody was saying 'It will be down again in the next year, we needn't worry too much.' I formed the view that we were on a new plateau. From there we edged up again with only occasional minor reductions in the total volume of traffic in terms of passenger miles and ton miles. So one had to consider how we were going to proceed with a steadily rising traffic as appeared likely.

First it was necessary to look at the financial position. The undertaking was barely viable in the sense that the budget was just balanced, that is the revenue was equal to the working expenditure, the provision for depreciation and the payment of the obligatory debt charges. So some tightening up of the budget and firm control of expenditure were necessary. I have always been very sensitive about trying to run a railway in deficit, because the first management experience I had was in Tanganyika where the railway ran at a deficit. I was plagued by people at all levels of Treasury, querying this and that and why do you spend twopence on something. If you have got a viable undertaking paying its way so that you have got a margin of revenue you can forget about the Treasury, you can look after yourself. What you have got to do is get the undertaking credit-worthy, able to pay the interest on the capital. Once well in that position the question became, 'Now you are credit-worthy, what do you do?'

The one thing we had to do fairly quickly was to undertake improvements to enable the higher volumes to be moved. It is reasonably easy to buy ships, locomotives or wagons, but the changes that were necessary in what is now called 'infrastructure' are more important because planning and construction takes longer. All the crossing loops from Atbara to Port Sudan were lengthened. The laying of heavy rail, which had been going on sporadically for some time from Khartoum towards Wad Medani, was confirmed to El Obeid so that the new locomotives could move over the whole system, making more effective use of them over a longer length of track. On the Kassala line, which seemed to me to be destined in time to become a major artery as well as serving local needs, there were large sections of very unstable black cotton soil to which it had been policy over the years, quite rightly, to add gravel so that the road-bed could gradually be stabilized. This work was continued and indeed increased to give a better base there. The Engineering Department had, over the years, brought the infrastructure to an excellent standard.

With good operating performance we were never actually short of wagons and locomotives. It was very tight from time to time, but we managed with only modest changes. The principal aim was to get the basic facilities ready so that as the traffic rose we could use additions to the rolling stock effectively. In a similar fashion it was realised that the time was coming up when more than the original berths would be needed at Port Sudan. That was very difficult because there was a knuckle with very hard coral. With great difficulty we were able to set aside funds and dredge the area so at the right time it would be a simple matter to build the wall to form additional berths.

Once we had got the finances in a reasonably good state, the question arose of how to develop the national rail system. There was a commitment looming up to build a line to Roseires since the government was well advanced at that time with the planning for the Roseires dam and it was quite clear there would be an input of heavy materials of one sort or another to enable the dam to be built. I thought the best thing to do was get the Roseires line built fairly quickly. All sorts of second-hand materials from relaying operations and from stock were used. This light material was adequate for the traffic and laid quite quickly in one dry season; there was about a year to spare, so that the formation could be consolidated before heavy tonnage began to move over it.

It concerned me when I came to the Sudan that the country should have enormous outlying provinces, Darfur and Bahr el-Ghazal, so far away and so poorly served by the national transport system. I had met by that time Frank Lorimer who was then Governor of Kordofan and I sent him a note of the inward tonnages at El Obeid the previous year and the outward tonnages of the various commodities. I asked if he would have a try at splitting these totals to give the ultimate destination of the imports and the source of the exports. From his very informative reply I was able to make a rough evaluation of where the

goods would be put on rail and where they were likely to go if we extended the system to the West. Now that was very satisfactory and gave me a very good idea of where we should be going, because I thought, 'It's right that the national system, if it's able to pay its way and if it's credit-worthy, should borrow the money to go ahead with these extensions even though traffic is relatively light in the first years.' Then I paid a visit out there with my successor Muhammed El Fadl, who was by this time Chief Engineer. To obtain a detailed impression of the country we came back from Geneina through Zalingei and Nyala, more or less along the route of the projected railway. When we reached ed-Da'ein we asked the price the merchants were giving for groundnuts, and it was exactly half what they were getting in El Obeid. This gives an idea of the difference it makes to the grower when he can get the stuff straight on rail. So out of that we put forward a scheme to build about a hundred miles a year each dry season, and we got the first section open to Abu Zabad and then later on to Babanusa, which was going to be the junction for the south-west. We did a lot of hard thinking over the siting of the junction at Babanusa, especially considering the social factors that Richard Hill has mentioned, because I have myself seen many railway towns that are not entirely satisfactory from the social point of view. However, we discussed the matter at length with Abdallahi el-Amin al-Khalifa who was then Governor of Kordofan. We decided if we were going to go to a sizeable existing town it would have to be Muglad, which was too far south to get the shortest line to the west, so we finally settled on Babanusa. The name was given by Abdallahi. So we settled on the site, we settled on the name, and by the time that I left, the line was just approaching Babanusa. Two years later it reached Nyala.

The line to the south-west was a rather different proposition which we'd planned to undertake after the line to the west had been completed. Bahr el-Ghazal Province was already served seasonally by a steamer service. This seasonal service on the Jur river was a monumental exercise every year; all the ships had to be prepared, crews sorted and the fleet up the Jur ready to move as soon as the water was high enough. The vessels had to be offloaded and reloaded with the goods lying at Wau, ready to move down before the river level fell. It was really quite a fantastic and expensive exercise. I could not see how any serious economic development could take place with such a limited service. Moreover, the Jur River service was a principal reason for the continuing deficit on the steamer services. If the railway had not been built, heavy expenditure would have been necessary on new craft, so my Sudanese successors built the line.

The construction of these two lines has been criticised by independent so-called experts, chaps in the World Bank and other institutions who came around and said, 'Oh yes, these lines are now running at a loss' - this on the basis of inadequate economic analysis. I defend the decision without

qualification. If you are going to unify the country, if you are going to have a single exchange economy (with few people outside it) then you have to link these provinces to the national transport system. Darfur in particular is a very productive area, and if the undertaking is operating on a healthy financial basis why should its credit-worthiness not be used to extend the system into these areas? So these schemes were in progress at the time of independence. I must say my Sudanese successors carried them out in a very creditable fashion and there is a railway capable of probably the lowest operating cost of any railway in the world. Operating over these enormous flat plains, you could have train loads not of hundreds but of thousands of tons with practically no serious grades apart from getting over the hump to Port Sudan. The unit cost can be at least half of any other possible mode of transport.

THE MECHANICAL DEPARTMENT OF SUDAN RAILWAYS, 1929-1955

G. K. Wood

My time in the service ran from 1929 to 1955, spanning a period between oil lamps and Kyko fans, down to the war years and Sudanisation in 1955.

A young recruit, arriving in the Sudan in May 1929 in full summer heat and Atbara *haboobs*, was given a good quick idea of the problems of the country and their effect upon machines, mechanical and human. Then the Depression of 1931 caused wholesale retrenchment. It became clear that mechanical engineers have an awesome amount of the country's capital locked up in their hands. A mistake in ordering equipment, however well it performed in good conditions elsewhere, could land the Sudanese in expense that could cripple some vital new scheme or perhaps lose a new hospital.

A Sudanese engineer once said to me, 'We like to get British-made machines as the British have lived in the Sudan and they know what damage our sandy grit can do to delicate machine parts.' An unfortunate experience with 10 Garratt locomotives was a lesson which no one in the Mechanical Department will forget. Luckily by persistence and choosing the right moment in 1949, we found a buyer in Rhodesia (Zimbabwe) and were able to sell them at a satisfactory price: we understand they still do good service there. I was not involved in the original purchase but the sale, safely completed over 30 years, remains one of the happiest days of our time.

In 1952 increasing traffic made a building-up of locomotive power essential. At the time diesel-electric locomotives were starting to challenge steam power all over the world, and many people urged us to leave the Sudan with a first class batch of modern diesel-electrics. On the other hand, it would also have meant a great expense, since at that time one diesel-electric locomotive cost about three times as much as a steam engine and it also requires its own expensive parts from its own makers (at their own monopoly price). Most of all, it would have meant substantial re-training of repair shop personnel at a time when many of the supervisory staff might be affected under the Sudanisation plan.

So we gave the biggest order ever contemplated in Sudan Railways for 50 modern oil-burning steam locomotives. This, though considered by some to be depressingly old fashioned and pedestrian, gave our Sudanese successors time to make the eventual change to Diesel as and when they wished. The first Sudanese General Manager, Sayed Mohammed Fadl, giving an address at a gathering in London, said that their first batch of diesel-electric locomotives suffered so severely from Sudan dust that the entire batch had to be taken out

of service and completely rebuilt, after which they gave good service, unlike some others that did not. He also added with characteristic candour that had it not been for our 50 steam locomotives, he did not know what would have happened to the service. His subsequent perceptive remark was that the long rebuilding process gave his men an unequalled chance to learn, like medical students with a body, the wasting diseases that the Sudan dust can bring about in man-made mechanisms.

The Railways had always realised the importance of training. All departments ran training groups, and in the districts the drivers and firemen's schools trained all enginemen for the future. The Mechanical Department ran the Sudan Railways Technical School to train all future artisans in the mechanical engineering trades.

One of the newer services falling to the Mechanical Department was the works training of the Khartoum University Engineering students and a batch came to us each year in Atbara. At that time their nickname for Atbara was 'the city of steel and fire'. We sent the students first to our Technical School to learn to handle the usual workshop tools in comfort, and more or less in private, and then into the Atbara workshops wearing boiler suits and heavy boots to learn the facts of engineering life. Though some of the students found the first few months something of a shock, by the time their year was up, they realised they were much better fitted for the life ahead of them, and in the years to come they were extremely successful. In fact, we often hear from ex-students in many parts of the world in highly responsible positions, referring to 'the good old days' and saying that their Atbara spell stood them in good stead in later life.

Another stage in our evolution was the coming of the labour movement in the early 1940s, together with some strikes. A railway tends to be an easy target. Apart from the waste of time and money caused by strikes, the Sudan's slender resources rest in the hands of those who maintain them. A case in point is the long downhill run from Summit to Port Sudan, where the price of freedom from brake failures and the consequent disastrous run-away depends upon the maintenance men everywhere, faithfully carrying out their duties day after day and night after night, possibly without much supervision in some areas. A group of men who might have used the strategic importance of their job (as some do elsewhere) were the pumpmen, often working in some remote spot and with virtually no supervision, year after year maintaining the vital water for the locomotives and often for the local population as well.

Our department, which mustered perhaps 8,000 Sudanese, largely concentrated in the Three Towns and subject to the usual human pressures, became a target. It appeared in general restlessness, dislike of discipline and authority, and it was our business to keep in touch with the young and fiery leaders. We

learnt a lot from them both at work, at football matches, and hour after hour in our meetings with trade union leaders at the annual conference. Even so, strikes occurred in the main centres and gave much anxiety to anyone in authority.

The late Sir Hubert Huddleston, who must have decided to find out for himself something of the restlessness and stirring of labour in the country, asked me to dine with him one night at the Palace. As we were alone, I had a chance to explain that there was unrest among the enginemen who seemed to feel that there was something undignified in wearing their practical enginemen's uniform and, as a protest, the express would come into Khartoum with driver and fireman in flapping *gallabiahs*. I suggested that perhaps when next travelling by train, he could have a talk with the enginemen on his train, and by showing an interest in them, it would get around that they were appreciated.

To my surprise, the next thing to happen was a telegram that His Excellency wished to travel on the engine of his train on the way to Port Sudan. Accordingly, a large boiler-suit was made for him in the Atbara tailoring shop and one morning he and I travelled in our boiler-suits from Haiya to Gebeit on his engine, which happened to be a coal-burner.

Getting away from Haiya is uphill work and the engine has to be driven hard. As the fireman was nervous and was taking a long time drawing the coal forward, steam pressure was going back and I thought to have the Governor-general's train stall through lack of steam was the last thing for our demonstration. I therefore took the shovel myself, having fired many of the Scottish expresses in my time as a pupil of Sir Nigel Gresley as well as during the General Strike. So it was no new experience, but I was rusty. Fortunately, the engine responded and steam pressure rose quickly, whereupon Sir Hubert said, 'Do you mind if I have a go?' As the engine was working hard I said, 'A little later on,' as a mistake in firing would have stopped the train and the publicity would have been counter-productive. When we topped the bank and were running downhill, I gave him the shovel and after a bit of practice, the coal went through the fire hole quite well and to Sir Hubert's delight steam pressure rose nicely. Afterwards, when we met in London he remembered and would say, 'Wood, I've still got your boiler-suit! Come and have a drink.'

The enginemen were delighted and we never had any more trouble about wearing their uniforms. I've not known many Governor-generals, but I would be surprised if Sir Hubert's perceptive and kindly act could be matched anywhere in the world.

NILE RIVER TRANSPORT, 1934-1955

P. C. Bryson

I was employed in the Steamers section from 1934-1955. The key question was economy. We were running a fleet of steam vessels which were very uneconomical on the long journey south. The longest and possibly the most important reach on the White Nile was Khartoum/Juba, a distance of 1090 miles. The journey south took fourteen days, the journey north ten.

Rejaf and *Omdurman* were the usual steamers on the postal run. Had they carried sufficient coal for the round trip (about 120 tons) there would have been little or no space left for passengers and cargo. Coal was therefore transported south at great expense to depots at Malakal and Shambe by other smaller steamers using wood for fuel which was collected at stations along the river banks.

The obvious solution was the motor vessel, so my first job was to sit down at the drawing board and produce the first Diesel-driven Quarterwheeler suitable for the postal service. It took me about three years to complete the design, obtain the necessary machinery from England, and assemble the hull together with modern accommodation at Khartoum North. *Nasir* was commissioned in 1938 and immediately became the pride of the southern postal service. She had twin Diesel engines each 180 bhp driving paddle wheels fourteen feet diameter through worm reduction gears. But the important part was that she could carry 20 tons of light gas oil sufficient for the round trip to Juba.

Thereafter, the steamers were doomed. Other motor vessels followed - *Gordon Pasha* (which figured on the 1950 4¹/₂ pt postage stamp), *Kabir*, *Lord Cromer* and others, all smaller than *Nasir* but economical units for general and dangerous cargo to the southern reaches. Good use was made of them during the flood river period when additional sailings were required to Wau and Gambeila.

Of course the paddle wheel is a very inefficient means of marine propulsion, especially when fixed floats are used as was the case with all our steamers. We had no alternative because the floats could be replaced easily when damaged by floating *sudd* or logs, whereas the feathering float would have required a forge to repair bent or broken arms. Nor was the screw propeller very successful on the southern reaches for the same reason, but on other reaches where there was less floating matter we could see a future for this type of propulsion.

In the early 1940s we designed and built a tunnel screw vessel at Khartoum North for service on the Dongola reach. The advantage of the tunnel screw was that with, say, two foot six inches draft we could swing a four-foot propellor which remained fully immersed in a column of water in the tunnel.

The efficiency and economy of this vessel was so great that when in later years renewal of the Halfa/Shellal fleet was considered, tunnel screws were chosen. This new fleet was built on the Clyde by Dennys, dismantled and transported to Wadi Halfa Dockyard where they were reassembled and commissioned.

THE MARINE SIDE OF THE TRANSFER OF POWER: THE SUDANISATION OF PORT SUDAN AND THE FOUNDATION OF A STATE-OWNED MERCHANT NAVY

Mekki El-Sayed Ali

The educated Sudanese who were the products of the only higher secondary school in the Sudan, the Gordon Memorial College, Khartoum, particularly the first batches of its graduates who joined the civil service between 1906 and 1912, looked forward to holding posts of responsibility in about 1928-29 after 20 years of experience.

The authorities were hesitant on this issue: the international financial crisis of 1929-30 overwhelmed the whole world, then came World War II. Instead of automatically pushing forward promotions, the result was retardation and until that time no Sudanese was promoted to scale 'D', the status of a new British university graduate appointed to the post of District Engineer, District Traffic Manager or District Locomotive Superintendent. From this period the Sudanese were pressing for promotion to posts of responsibility but there was no response.

In 1942-43, however, the Civil Secretary came to the conclusion that it was politically essential to speed up the promotion of Sudanese to higher posts in the administrative service and consulted most of the province Governors and senior British officials. He was disappointed to win no response from most of them. Only two wholeheartedly agreed with him. Others expressed their fear of the probable diminution which might arise in the efficiency of their provinces. Only a few promotions were made and it was not until 1944-45 that the Railway got four scale 'D' posts: two District Engineers and two District Traffic Managers.

In 1945, immediately the war was over, the Sudanese Graduates' Congress submitted a memorandum to the Governor-General as the representative of the Condominium, raising demands including self-determination which meant quick, and indeed immediate, steps to qualify the Sudanese to take over. No consideration was given to that request nor was it even referred to the two Condominium governments.

The graduates as a result took different ways to achieve their aims. Most of the members of the Congress were compelled to resign their posts if they wished to indulge in politics. They did so and formed political parties. Some were fighting for independence and others, supported by Egypt, were fighting for unity with Egypt.

In July 1952 occurred the Egyptian Army coup d'etat followed by the abdication of King Farouk. General Neguib at once won great esteem among

the Sudanese advocates of national independence by giving up the previous Egyptian claim to sovereignty and agreeing to allow the Sudanese independence from Egypt if they wished it. In the course of two or three months he held a number of conferences with the Sudanese political parties and signed separate agreements with them all based on various amended versions of the British new self-government statutes. He was then able to start negotiations with the British government.

The clauses of the agreement included complete and immediate Sudanisation of the administration, army and the police and any other posts likely to have political influence affecting the free and neutral atmosphere for the Sudanese to vote. This was approved by the two governments and immediately a Sudanisation Committee was set up. The members were: Sayed Abdel Hamid Dawood (Egypt), Mr R.R. Burnet (UK), Sayed Ibrahim Yousif Suleiman, Sayed Osman Abu Akar, Sayed Mahmoud El Fadli (Sudan). There were three non-voting members: Sayed Abdel Magid Ahmed and Judge Ahmed Mutwali Atabani (Sudan) and Mr A.M. Hankin (UK).

The Committee started its work visiting the various government departments and units and had discussions with the heads of departments who were all British, and also with the two or three senior Sudanese in each department as well as with representatives of the officials' union. They came to Atbara and Port Sudan.

Sudanese and the railways

Until that date only three Sudanese in the whole Railways administration had been promoted to the 'B' scale: one as Divisional Engineer, the second as Divisional Traffic Superintendent and the third as Established Officer.

On 8 December at Khartoum the Committee discussed with the Minister of Communications (Sayed Mubarak Zarouk) the Sudanisation of the Railways. On 9 December it was decided unanimously that the post of the General Manager should be Sudanised as soon as possible and that of the Deputy General Manager immediately. The Committee also decided by majority vote that the posts listed in Appendix II of the document before them were likely to affect the free and neutral atmosphere and should be Sudanised immediately or as soon as possible.

The British member dissented on the grounds that the Committee, in classifying as influential 140 of 160 posts held by expatriates in the Railways, was interpreting its terms of reference in a manner not intended by the Co-Domini and that the precipitate Sudanisation of most of the key technical posts would at best lead to suspension of new works and development programmes and reduction of the Railways to a care and maintenance basis. The Committee recommended that the General Manager be retained as a technical adviser and

that expatriate technical advisers be appointed in the Engineering, Mechanical, Steamers, Dockyards and Electrical Departments. It was also decided to draw the attention of the Council of Ministers to the fact that a number of Egyptians (including some domiciled in the Sudan) whose posts had been declared influential did not come within the ambit of the Compensation Ordinance as they were not on expatriate rates of pay, and were not therefore entitled to compensation under the terms of the Ordinance.

The Committee's decision and recommendations, with a note of dissent by the British member and a reply by other members, were forwarded to the Council of Ministers on 12 December. The Council altered the Sudanisation priority of a number of posts in the Mechanical, Steamers and Stores Departments and reclassified others from 'immediate' to 'as soon as possible'; thus amended, the decision was approved by the Governor-General.

The total number of expatriates in the Railways at that time was 142. The forecast for 1955 was as follows: 29 normal retirement, 17 unforeseen retirement, 96 remaining number of expatriates. All posts were Sudanised except the post of General Manager. The Deputy General Manager, formerly a British official, was replaced by an Indian. The Chief Mechanical Engineer and his deputy were replaced by a Pakistani and an Indian respectively.

The Sudanisation of Port Sudan

The Port authority was at that time the General Manager of the Sudan Railways, the port being one of the Railways departments. The Port Manager was the representative of the General Manager in Port Sudan and, in addition to shouldering responsibility for the safe running and managing of the port, he was to coordinate the full cooperation between the representatives of the other Railways Departments in Port Sudan - Mechanical, Engineering, Traffic, Catering and Accounts.

The Port administration has two branches: the traffic and commercial side and the marine side. The post of the port Traffic Superintendent had been Sudanised in about 1952-53. The Marine side was operated by a Harbour Master, assistant Harbour Master and about six or seven pilots, all expatriates, and until 1953 no attempt was made to train Sudanese to fill these posts. Other junior appointments such as those of tug masters, quays and berthing masters were held by Sudanese. A trial made to train two of the tug masters by giving them sea-going training to qualify as pilots was not successful because their education was only to the intermediate grade.

In 1957-58 a trial was made to select boys of secondary education and, on a grant from Greek merchants domiciled in the Sudan, four were sent to the Greek maritime high school, given academic training and put on board vessels for their sea-going, practical training. Later, in 1960, 20 Sudanese of secondary

education were sent on a grant from Yugoslavia to the Yugoslav maritime high schools to qualify as deck officers and mechanical engineers. Accordingly, it was not possible to Sudanise the Marine section of the port and the expatriates were retained until about 1968, when their posts were fully Sudanised by graduates from the maritime high schools in Greece, Yugoslavia and Britain (Southampton).

The posts of Port Manager, Dock Superintendent, Shore Supervisor and Chief Warehouse Inspector were all Sudanised immediately (in accordance with the recommendations of the Sudanisation Committee) as likely to affect the free and neutral atmosphere for Sudanese to vote.

The foundation of a state-owned merchant navy

In 1959 Marshal Broz Tito paid a friendly visit to the Sudan. The question of cooperation between the two friendly countries included technical, educational, economic and agricultural coordination, starting with a credit of 5 million pounds sterling to help the Sudan programme of development. Among the various other activities for which the loan was used, the Sudan considered a state-owned commercial sea fleet and maritime trade to enable the Sudan to transport its exports and imports during peace as well as during wartime in its own fleet.

Specifications were prepared to suit the volume of the Sudan trade and its routing. The Sudan insisted on calling for international tenders for building the ships. The lowest offer was given by the Yugoslavs - 650,000 sterling for each vessel. The agreement for building included an undertaking to provide the technical staff for posts which could not be filled by Sudanese, and at the same time they began by taking 20 Sudanese students for training in their maritime high schools to qualify as mechanical engineers and deck officers at their own expense. The course lasted 3½ years. In addition, the Yugoslav authorities undertook to provide the necessary seamen until Sudanese were trained.

The agreement was signed for building two ships to start with, the first to be delivered in 22 months' time and the second two months after the first, when a further contract on the same basis was to be signed for building a further two ships.

The Sudanese insisted on starting the business between the two countries in partnership, probably to assure high-quality construction and to provide experts to operate and maintain the ships until we had trained Sudanese to take over. The Yugoslav delegation were reluctant to accept the principle of partnership on the grounds that it was against their principles to go to Africa and start capitalist enterprises. The Sudan delegation insisted. The Yugoslavs accepted, receiving sanction from Marshal Tito.

The agreement provided that the partnership should not continue for more than eight years, and that the Sudanese could take over at any time they wished. Things went perfectly well: the ships were delivered on time and operated with good profit and the shipping company was able to cover its expenditure, pay the six months' instalments on the value of the ships and above that to secure a profit. It was agreed that the loan was to be paid off in eight years' time. The interest was three per cent. The partnership was dissolved in 1966, when the Sudan Line became Sudan government property. The fleet of four ships was increased in 1971 by two vessels and continued growing with one further vessel in 1973, one in 1974, seven in 1979 and one in 1980.

The Sudanese students who studied and trained in the Yugoslav maritime high schools are now captains and chief mechanical engineers on board. Office staff too had been given intensive training in the Sudan and abroad. Thus the scheme is considered to be one of the most successful development projects.

THE HISTORY OF AIR TRANSPORT IN THE SUDAN

E.J. Dawes

The history of aviation in the Sudan goes back to the days of 'those magnificent men in their flying machines': the first aeroplane arrived at Khartoum on 12 January 1914, when a Frenchman named Pourpe flew non-stop from Abu Hamed to Khartoum, a distance of about 340 miles. Two British airmen, Lt Col Sir F. Maclean and Lt Col A. Ogilvie arrived approximately two months later in the first 'Hydroplane' to be seen in the Sudan.

In 1916 four aircraft of No. 17 Squadron of the Royal Flying Corps were sent from Egypt to Rahad, the Kordofan railhead, to assist in operations against Ali Dinar, the Sultan of Darfur. Temporary landing grounds were cleared at Rahad, Nahud and Jebel el Hilla. These aircraft were used for aerial reconnaissance and other tasks between 15 and 23 May. The occupation of El Fasher on 23 May saw the conclusion of the campaign after which the aircraft were withdrawn to Egypt.

In February 1918 a Civil Aviation Transport Committee, chaired by Lord Northcliffe, made observations on a number of routes of commercial importance, including the London/South Africa route via Egypt and the Nile valley, through the Sudan. In 1919 the Royal Air Force (RAF) commenced a comprehensive survey of the route from Cairo to the Cape, and established 43 landing grounds, 23 of which had refuelling facilities. Approximately ten of these landing grounds were in the Sudan, ranging from Wadi Halfa in the North to Juba in the South. The first flight over this route was made by Lt Col Pierre van Ryneveldt and Captain Brand, two South African army officers, in a Vickers Vimy twin-engined bomber, leaving Cairo on 22 February 1920 and reaching Bulawayo on 5 March. Thereafter numerous flights were made through the Nile Valley route by the early pioneers.

Early in 1920 a contingent of RAF aircraft ('H' Unit) was detached to the Sudan for cooperation with a punitive expedition against insurrection by the Garjak Nuer. After a relatively minor bombing mission in the disaffected area the Nuer chiefs sued for peace and the aircraft were withdrawn.

In 1926 a series of flights were made by 216 Squadron of the RAF using Vickers Victorias, to test the mobility of the east to west route from Khartoum to Bathurst in West Africa, via El Obeid, El Fasher and El Geneina. This was to become one of the most vital feeder routes of World War II. By March 1926, the Air Ministry was considering a Khartoum/Kisumu service, but the modified De Havilland Pelican and the Fairey III 'D' class floatplane suffered crashes, ending the service in 1927. In January 1928, Sir Alan Cobham made a

round-Africa survey in a Singapore Flying Boat, and the data he gathered proved of great value when the Empire Flying Boats began to fly down the Nile Valley route in 1937.

Imperial Airways (Africa) Ltd was registered as a private company on 6 June 1929, and in October 1929 began a comprehensive study of the Cairo/Cape route. Not until January 1931, however, did the company sign an agreement with the Egyptian government. The first service actually left London on 28 February 1931, and by 1932 the airmail scheme, via the Sudan to East Africa, provided three services each week, taking two-and-a-half days. In these formative years a variety of aircraft were used ranging from Argosy bi-planes, Hannibal class aircraft, Calcuttas, Kent Scipio Flying Boats and 'C' class Flying Boats to Hercules.

Imperial Airways also teamed up with the Elder Dempster Steamship Company to run a service from Khartoum to West Africa, and in May 1935 it was announced that a service would commence along the Khartoum/El Fasher/El Geneina/Fort Lamy/Maiduguri/Kano/Kaduna/Lagos route. Regular services commenced in February 1936, taking two days from Khartoum to Kano (night-stopping at El Fasher) and three days for the return journey to Khartoum. By October 1936, the service was extended to Lagos. By re-fuelling at every stop the DH 86 was able to carry two crew and five adult passengers.

With the need for new aircraft clearly apparent, in 1935-36 Imperial Airways took the unprecedented step of ordering 28 Short 'C' class Flying Boats straight off the drawing board. The first of these, 'Canopus', came off the slips in July 1936, and went into service in October 1936, carrying 24 passengers at a speed of 145 mph. These flying boats introduced a new era of comfort, speed and reliability over the Nile valley route to South Africa.

In 1935-36, 216 Squadron was based at Damer, during the Italian-Abyssinian crisis, but they were not called upon to take any action. The collapse of France in June 1940, and the entry of Italy into the war, severely interrupted and curtailed most British-operated air routes. A new route joining Britain with the East and with South Africa had to be found and opened quickly. Flying Boats were used to carry government-sponsored personnel from the UK through Lisbon to West Africa, there linking with the trans-African route to Khartoum pioneered in 1926.

With Italy at war, a steady supply of aircraft was urgently needed in the Middle East. This brought into being what became known as the 'West African reinforcement route', the most significant movement of aircraft in Africa and the Middle East during the war years. A RAF advance party of 24 officers and men, led by Group Captain H.K. Thorold, arrived at Takoradi on 14 July 1940, and set about the immense task of organising ground facilities, turning primitive landing grounds into efficiently staffed staging posts, and perfecting wireless communications, along the route Takoradi/Accra/Lagos/Kano/Maiduguri/El

Geneina/El Fasher/El Obeid/Khartoum, and thence north via Wadi Halfa to Cairo. The main party of 350 officers and men arrived at Takoradi on 24 August 1940. The first consignment of crated aircraft - six Blenheim IVs and six Hurricanes - docked at Takoradi on 5 September, and the following day 30 Hurricanes arrived. Assembly work started immediately and on 19 September the first convoy consisting of one Blenheim and six Hurricanes stood ready for take-off. By now French Equatorial Africa had been taken over by De Gaulle so the pilots had the satisfaction of knowing they would be flying over friendly territory the whole way. Seven days later one Blenheim and five Hurricanes arrived in Egypt. Thereafter, there was an uninterrupted movement of aircraft through the Sudan during the whole of the Middle East war.

As the war-shattered world of 1945 tried once more to reach decisions on air transport priorities, it was decided to re-establish those routes which had been developed and proved before the war. Along the Nile valley route Sunderland Flying Boats played an important part in setting up the post-war services until they were replaced by Argonauts and by pressurised Hermes from 1949 onwards. In March 1951 development flying began with a new revolutionary jet transport, the De Havilland Comet I, and on 2 May 1952 BOAC made airline history when its first Jetliner left Johannesburg via the Nile Valley route. It is of interest to record that the tropical trials of the Comet I were carried out in the Sudan in 1951. After the Naples and Elba Comet I disasters in 1954, BOAC replaced the Comets on the African services, but 1960 saw the return of pure jet services to the Nile valley in the form of Comet IV 'B's, Vickers VC-10s and Boeing 707s.

For several years immediately following the end of the war, the Sudan government made intensive use of a charter service to and from the UK, operated under contract by Airwork Ltd with Vickers Viking aircraft, to transport Sudan government officials and their families to and from UK on leave. On average some three to four flights a week were made, following the route Khartoum/ Wadi Halfa/Malta/Nice/UK, nightstopping at Malta in both directions.

A domestic airline

In the midst of intensive post-war activity in commercial air operations it became apparent that if it was to keep pace with modern progress the Sudan must be equipped with a system of domestic air routes, centred on Khartoum. Here was a country of nearly one million square miles with extremely limited surface communications. What roads there were consisted of ungraded tracks closed down for long periods during the rainy season. River services were confined to the two Niles, apart from a seasonal movement of steamers on the southern tributaries. The railway system ended at El Obeid.

In 1946, therefore, it was decided to form a domestic airline as a department of the Railways, and after consultation with Airwork Ltd, four DH Dove aircraft were ordered with delivery to commence in January 1947. Technical operation was to be provided, under contract, by Airwork Ltd, and the commercial organisation was to be covered by the Railways. Joint managers were to be appointed by the Railways and Airwork Ltd, and the first services commenced in July 1947. The contract details were arranged by the Financial Secretary's office.

A vast amount of preparatory work had to be undertaken. A large unused war-time hangar from Wadi Saidna, complete with electrically operated cranes, was dismantled and re-erected at Khartoum Airport. The hangar was large enough to accommodate several Dove aircraft, and Airwork's technical staff had to organise and set up adequate maintenance facilities complete with stores which included refrigerated stores for spares containing rubber. On the Railways side, the routes of the domestic services had at first to be limited to places with established airfields or landing grounds. Consideration had to be given to inclusion of routes with a 'strategic' value as decided by the Civil Secretary's office. Fares, freight rates and charter rates were assessed. Traffic operations manuals had to be prepared, tickets, load sheets, and many other necessary traffic forms designed and printed. Staff had to be recruited and trained not only for Khartoum but also for the various airfields to be served. Offices had to be acquired and furnished.

Initially it was decided by the Railways department to seek BOAC's help in running this strange and entirely new type of commercial operation, but BOAC reluctantly withdrew from the arrangement, and the Railways released one of their own staff to manage the airline.

The Sudan registry of aircraft was opened by the Civil Secretary's department in 1947. The Sudan registration letters are SN followed by three letters. Registration is limited to ownership by the Sudan government, by a Sudanese, or by a company incorporated and registered in the Sudan and having its principal business in the Sudan. The first aircraft to be registered was the first Dove which was given the registration letters SN.AAA. The delivery of the Dove saw the commencement of 'proving flights' which revealed many difficulties to be overcome in setting up the out-station ground facilities.

Some initial difficulty was experienced in getting the Sudanese to take to the air, and this was solved by carrying out demonstration flights all over the country to illustrate the enormous advantages of air transport over conventional surface transport, and to inspire confidence and an air-minded attitude in the Sudanese. These demonstration flights were outstandingly successful and showed to the trading community how a three-day camel journey, for example, could be flown in under one hour. It was not long before service frequencies were having to be increased.

After some time it became apparent that the control exercised by the Railways department was tending to restrict Sudan Airways growth, particularly where the Airways services ran parallel to those of the Railways. Sudan Airways was therefore created as a separate government department with its own budget, and under its own General Manager, thus giving it more freedom to develop its own air routes.

At first, with the exception of the service to Asmara via Kassala and charter flights to adjoining African countries, services were confined to the Sudan, based on Khartoum, and operating to Kosti, Malakal, Gambeila, Wau, Juba, El Obeid, El Fasher, El Geneina, Port Sudan, Wad Medani, Kassala, Atbara, Kareima, Dongola and Wadi Halfa. A fifth Dove was added to the fleet in 1953, and from that year the Doves were progressively replaced by 28 seater Douglas DC 3 'C's, and the routes extended. The first international flights were begun in November 1954 to Cairo, Entebbe, Beirut and Jeddah, and the Asmara service was extended to Aden. The DC 3s served Sudan Airways well without loss, until the introduction of three Fokker F 27 Friendship aircraft in 1962. Sudan Airways were the first airline in Africa to use this popular type of aircraft.

For the record, mention must be made of the difficulties encountered by Sudan Airways in its first one or two years of operation, when navigational aids were restricted to Juba, Malakal, Khartoum and Wadi Halfa. Over other routes pilots were confined to visual navigation over some particularly featureless country, especially over the swamps of the southern Sudan to such places as Wau, and this resulted in a few difficult situations and diversion. These difficulties were quickly overcome by the installation in the Dove aircraft of radio compasses which enabled them to 'home' on their destinations from a distance of some 100 miles.

No survey of the growth and development of Sudan Airways would be complete without special mention being made of an outstanding pioneer of civil aviation in the Sudan, and in Africa generally, namely Sayed Abdel Bagi Mohamed. He, more than anyone else, was instrumental in putting the Sudan on the civil aviation map. He commenced his career as a clerk with British Overseas Airways Corporation and quickly reached the rank of Station Superintendent at Juba. Late in 1946, BOAC reluctantly released him to join Sudan Airways as a Traffic Inspector, and he progressed through the grades of Assistant Traffic Superintendent and Traffic Manager, becoming General Manager in 1954. His vast knowledge of aviation in Africa was requisitioned by the United Nations from 1965 to 1971, during which period he served on the Economic Commission for Africa as Air Transport Consultant. He was eventually recalled to Sudan Airways where his expertise was badly needed, and became a Director on the newly created Sudan Airways Board and eventually Chairman

of the Board. This dynamic character, so full of restless energy and affectionately known to everyone as 'AB', will always be remembered in Africa air transport circles and linked in particular with the history of Sudan Airways.

A momentous year for Sudan Airways was 1959, when Sudan Airways became a full member of the International Air Transport Association and the Association of African Airlines. A Vickers Viscount V 831 ('the whispering giant'), was acquired to fly the Airline's first Blue Nile service to the UK on 8 June, operating a twice-weekly service to London via Cairo, Athens and Rome, as well as a weekly service from Khartoum to Nairobi via Addis Ababa. This thoroughly reliable aircraft flew the highest number of passenger route-miles of any aircraft of that period. In 1962, increased load factors on the Blue Nile service led to the purchase of two De Havilland DH Comet IV 'C's to replace the Viscount, and the number of destinations served included Benghazi and Tripoli. The Comets flew reliably up and down the network for the next eleven years.

In 1968 Sudan Airways purchased three fourteen-seater Twin Otters, a very rugged type of propellor-driven aircraft with short take-off run, eminently suitable to operate to places with no all-weather landing grounds such as Dinder Game Reserve, Merowe, Gedaref, etc.

In 1974 two Boeing 707s were purchased each with 14 First Class and 135 Economy Class layouts, enabling the network to include Abu Dhabi, Bahrain, Doha, Dubai, San'a, Kano and Frankfurt, and resulted in a very substantial increase in passenger and freight traffic. In October 1975 two Boeing 737-200 'C's further improved and increased the frequency and capacity of the airline's regional services, particularly to places such as Cairo and Jeddah. It was also possible to use these aircraft to some of the busier domestic destinations such as Port Sudan, Juba, Malakal, El Obeid and Kassala.

Although wholly owned by the government of the Sudan, Sudan Airways had operated on a purely commercial basis since its inception. It became a public corporation in 1969, and in 1978 it was moved from the control of the Ministry of Transport to the Ministry of Defence. In 1979-80 Sudan Airways carried 519,000 passengers and 6527 tons of cargo. On international routes, particularly to and from the Gulf area, passenger and cargo traffic was booming, while on the domestic and regional services management spoke wryly of 120 per cent load factors. Heavy seasonal demands, particularly the transport of large numbers of pilgrims proceeding to and from Mecca during the Hajj season, presented special problems.

Unfortunately, the ability of the Airline to meet this overall heavy and increasing demand proved extremely disappointing. Delayed departures and cancellation of services at short notice resulted in severe criticism from a frustrated and long-suffering travelling public, and the Airline's performance led to censorious comments in the local press. It may be that in a genuine but



misguided desire to satisfy a rapidly soaring demand, planners were too optimistic in assessing the Airline's capabilities. Serious maintenance delays and disrupted flight schedules were also contributed to by an exodus of skilled Sudanese technicians and flight staff to the Gulf states where they were able to earn much higher salaries.

But in 1981 the General Manager of Sudan Airways, Sayed Ali Musa, became one of President Nimeiri's key confidants and trouble-shooters. An expert in management and organisation, he surrounded himself by a staff committed to a ruthless overhaul of the airline's structure. Following the recommendations of a detailed and very comprehensive survey, carried out by Trans-World Airlines executives, Sudan Airways embarked on a management training programme involving all departments.

Sudan Airways Sudanese pilots were all initially trained in the United Kingdom. They then flew as F 27 First Officers for two years before progressing to Boeing equipment. Conversion training was carried out by American Air-lines, whilst simulator training took place at the Air Lingus base in Dublin. Some 707 and 737 flight training was done at Dubai and Sharjah, but all F 27 flight training took place at Khartoum. Technical training was concentrated at Khartoum, where all but 20 of the 800 engineering staff were Sudanese. A new hangar at Khartoum, providing for greatly expanded modern workshop facilities, provided the capacity for Sudan Airways to do all airframe work on the 707s, 737s and F27s. 'A', 'B' and 'C' checks on the 707s were also carried out at Khartoum. 'D' checks, for the time being, continued to be carried out by British Airways in London. It was planned that by 1983 three-quarters of Sudan Airways' total training should be performed at Khartoum by 1983, with the enlargement and re-equipping of the training centre. The Airline also participated in a programme to establish a joint Arab air carriers organisation computerised registration system to be based at Bahrain. For southbound flights from Europe, Sudan Airways was linked to the British Airways 'BABS' computer system.

For some time Sudan Airways was in difficulty with the IATA Clearing House because of currency control regulations giving a low priority to the processing of the Airline's paper-work. This very seriously added to the Airline's difficulties, but the position was rectified when the government of the Sudan received sizeable quantities of financial aid from foreign countries, notably from the oil-rich Gulf states. However the cost of sustaining nearly one million refugees from Chad, Ethiopia and Uganda still restricted the obtaining of foreign currency in the largely agriculture-based economy.

The Sudan relies heavily on agriculture for exports and home consumption, and the vast areas of ground under cultivation for a variety of crops necessitates the use of a large number of aircraft for crop spraying, particularly during the winter season. Firms of many nations provided aircraft, under contract, and in

addition the Sudan Ministry of Agriculture maintained a fleet of crop spraying aircraft based at Khartoum. In 1982, government departments with executive aircraft included Sudan Police and the Council for the Southern Region at Juba. A number of foreign registered aircraft were used for extensive projects such as road building, oil drilling, etc.

At the end of World War II Khartoum Airport had two runways, one running N/S 1940 yards long, and one running NE/SW 1724 yards long. The civil parking area was very small, and the terminal building provided facilities to a bare minimum standard. The war-time American airport constructed at Wadi Saidna was suitable only as a diversionary or emergency airport; the only other airports of any consequence, with minimum facilities, were at El Geneina, El Fasher, El Obeid, Juba, Malakal, Port Sudan and Wadi Halfa. In the years immediately following the end of the war landing grounds were cleared at places such as Wau, Bor, Kosti, Nahud, Kassala, Gedaref, Atbara, Kareima, Dongola, Tokar, etc., to provide landing facilities for Sudan Airways aircraft. In 1953-54 major reconstruction work was undertaken at Khartoum airport. The main N/S runway was lengthened and strengthened (the prevailing winds at Khartoum are largely north and south), and a new terminal building was erected.

An essential feature of aircraft operation is the provision of air traffic control facilities and navigational aids operated to very sophisticated standards. Immediately after the end of World War II, BOAC found itself having to provide point-to-point and ground/air communications, not only for its own aircraft but also for the benefit of other airline and charter operating companies flying the routes also flown by BOAC. BOAC rightly took the view that the provision and operation of such services to civil aviation generally formed no part of their responsibilities, and this led to the formation of International Aeradio Association (IAL). IAL's involvement with the Sudan dates from mid-1947 when former BOAC staff at Wadi Halfa, Malakal and Juba were transferred from BOAC to IAL service.

From early 1950 onwards there was a gradual expansion of the ground services to aviation provided by IAL at Wadi Halfa, Malakal and Juba, and more modern equipment was brought into use at these three airports. At Khartoum IAL in cooperation with the Sudan government designed and defined the telecommunications and navigational aid systems, together with the Air Traffic Control and associated services, to be operated at the new Khartoum Civil Airport. These were associated with the implementation of the Sudan Flight Information Region (FIR) in accordance with the International Civil Aviation Operations (ICAO) regional plan for the African/Indian Ocean region. Thus, concurrent with the development in civil engineering terms, a flight information centre equipped with the latest system then available was installed on the first floor of the new Khartoum terminal building. The training of air

traffic controllers, employed direct by the Sudan government, was undertaken by IAL. The newly equipped airport was brought into use in the Spring of 1953 and the new airport was officially opened on 15 April 1954.

From 1953 onwards, IAL continued to provide air traffic control services to maintain the telecommunications and aids and navigational systems until December 1958, when their contract with the Sudan government was ended. By that time a sufficient number of Sudanese nationals had been trained by IAL to enable the government to assume direct responsibility for air traffic services.

The operation of communications circuits, and the maintenance of telecommunications equipment and radio-radar aids to navigation, became the responsibility of the Post and Telecommunications Department of the Sudan government. All this, of course, was in line with the policy of Sudanisation as agreed between the governments of the UK, Egypt and the Sudan in 1953. IAL, however, continued to second air traffic control, Meteorological and radio/radar maintenance engineers, in a supervisory capacity, until early 1970 when the sole remaining engineer was withdrawn.

By 1981 there were many airport inadequacies at Khartoum, which was still the only airport with full night-landing facilities permanently available (at Port Sudan they are available only on request). The 1954 terminal buildings were too small, and the existing 8300 runway not suitable for use by wide-bodied aircraft such as the Boeing 747. Even the Boeing 707 aircraft could not take off at maximum all-up weight for several hours of the day because of extreme heat.

A programme to build a new airport at Khartoum, at a site about ten miles north-east of the city and capable of handling the most modern type of aircraft, was studied, to be financed by one hundred million dollars from the Abu Dhabi Development fund. To facilitate the flow of traffic between the capital and the new airport a new bridge was to be built over the Blue Nile. The French Compagnie de Constructions Internationales (CCI) won a tender for execution of civil work at Juba airport, a redevelopment planned to cost \$10,878,000 and to be financed by the European Community. A new runway was to be constructed running parallel with the old one, thus making it possible for Juba to handle Boeing 707 aircraft.

At the beginning of the 1980s some eighteen international airlines operated regular services to Khartoum. Many of these airlines were handled by Sudan Airways whilst on the ground at Khartoum. The Sudan's national airline offered experience consolidated during 30 years of flying. It was the most experienced national airline in Africa, and it had an excellent safety record. One of its greatest assets was the warmth of a Sudanese welcome to its passengers and the staff's traditional courtesy to strangers, the warmth and courtesy so well known to all those who have been fortunate enough to work in the Sudan.

Note:

A bibliography is appended to the original paper in the Durham Sudan Archive.

ROADS

J. G. S. Macphail

The basic road pattern of the Sudan during the final years of the Anglo-Egyptian Condominium was very roughly a cross with its centre in the region of Kosti.¹ From west to east it followed the ancient Muslim pilgrim way from Geneina in western Darfur through El Fasher, El Obeid and the central Sudan to the Red Sea, originally at Suakin and latterly to Port Sudan. The approximate distance of this route was 2080 km. The vertical line of the cross was the old British imperial route from Cairo to Cape Town. This route began at Wadi Halfa and followed the track of Kitchener's railway across the Nubian Desert to Abu Hamed, thence to Atbara, Khartoum, Kosti and Malakal to Juba and the Uganda border at Nimule, a route of about 2850 km.

From these two arterial routes motor roads were made, the most important of which was probably the Juba/Aba road (211 km), the shortest link between the Nile and the former Belgian Congo. Other important lateral roads connected Juba and Wau (730 km), Wau and Kafia Kingi (544 km), Wad Medani and Kassala (500 km) and Tokar and Port Sudan (158 km).

Against a perennially tight budget Sudan government road construction was developing in two areas: firstly, a programme for the main towns and their suburbs. This was to continue the work already begun of making tarmacadam roads and maintaining their surface. This entailed the employment of trained road engineers and special machinery. The towns thus treated were Khartoum, Omdurman, Khartoum North, Port Sudan, Wad Medani and Atbara. Later, as money was available, the tarmacadam programme was extended to other towns such as Juba and Malakal, and, after independence, to major trunk roads, notably that which was to link Port Sudan with Khartoum by way of Kassala and Wad Medani. Outside the areas covered by tarmacadam roads, the road building programme was carried out by mutual cooperation between administrative and Public Works Department officials stationed in the provinces. Where there was no PWD road engineer in a district or even, in earlier years, in a province, the District Commissioner had himself to make the trace of a new road, arrange for the way to be cleared of grass and tree-stumps and build the bridges. Political Service officials with no formal engineering training developed an ability to become efficient road-makers. After construction the District Commissioner applied himself to the exacting work of annual maintenance.

Where there was a Public Works engineer with road-building experience his advice was of great help to the District Commissioner, particularly when the PWD were able to build permanent bridges over rivers or watercourses, the absence of which might prevent the speedy opening of a road. In districts like

the Upper Nile, where there are few stones and the road surface is of cotton soil or other friable earth, the provision by the PWD of mechanically-driven road graders was of enormous assistance. During the dry months, December to April, these earthscrapers were able to smooth the surface of the roads cleared of grass and wood. On a graded road a motor vehicle could attain a speed of 30-40 miles an hour. I shall give two representative examples of roads: one in the Upper Nile Province where there was a resident PWD engineer, M. Lees, and a mechanic-driver with a motorized grader; and the other in the western district of the Bahr el-Ghazal Province where there was no assistance from the PWD and the construction of the motor road from Wau to Kafia Kingi was carried out by local tribesmen, police and carriers under the supervision of the District Commissioner.

With regard to the first example I will take the Cairo to Cape Town road from the most northerly point in the Upper Nile Province, where the Renk sub-district met the boundary of the Blue Nile Province, through Paloich and Malakal to the ferry across the Sobat river. The work on this section of road provided an illustration of the cooperation that existed between province and Public Works officials. In 1933-34 the District Commissioner of al-Renk, H. A. Nicholson, and the mamurs Ibrahim Bedri and Abd al-Salam al-Khalifa, extended the motor road southward from Renk to Paloich and the river port of Melut. In 1935 the Renk and Shilluk districts were joined and became the new Northern district of which I was District Commissioner. I could thus handle as a single project the new, dry-weather road which ran through my district, a distance of 418 km. I was faced by one or two tributaries of the Nile on the east bank which formed a series of obstacles to the opening of the road. What we wanted was a permanent bridge over the Khor Adar with strong pillars and girders built by the PWD. Funds for the construction of this bridge were accordingly set aside in 1937 and the work was completed in 1938.

The second example which I have taken was the creation of a motor road from Wau to Raga and Kafia Kingi. The decision to build this road, 544 km in length, was taken in 1924. It was not an easy operation for the road would have to cross several large rivers such as the Sopo, Raga and Boro. For the greater part of its length the route lay through forest which meant that to prevent puncturing vehicle tyres the stumps of felled trees had to be dug out or burnt. After Raga the trace lay through the Kreish hills with many streams and small ravines in a rocky terrain which involved difficulty in making a good alignment and necessitated the building of many bridges. By the beginning of 1925 the motor road had been completed as far as Raga and reached its destination at Kafia Kingi by 1927. When I went from Wau to Kafia Kingi with carriers in January 1926 I spent about three weeks on the road; in the dry weather in 1927 the journey by motor lorry took two days.

The construction of the greater part of the road was supervised by the District Commissioner of the Western district, Major H. E. Hebbert, R. E., while I was put in charge of the last 96 km to Kafia Kingi. Raga being over 230 km from Province Headquarters we had no materials or tools for making a motor road, except a few axes and a sledgehammers. The bridges were made of tree trunks felled in the forest, the crosspieces to form the track for the vehicles were made of the branches laid across the tree trunks. As we had no large nails to fix the branches on the tree trunks we used creepers taken from the forest when the supply of locally made ropes was exhausted. The work of determining the trace of the motor road was done by the District Commissioner and later by me in the Kafia Kingi area. The making of the road was done by local tribesmen with the help of police and our carriers when the District Commissioner and I were living in the forest supervising the building of the bridge.

The question of using the services of local inhabitants to make roads has been much discussed and sometimes criticised. The subject was dealt with in a very sensible way by Major Stigand in his book on African administration.² The Egyptian *corvee* system was susceptible to many abuses, but that was very different from clearing the grass and obstructions off roads within one's own area. Admittedly, the District Commissioners hoped that in time the PWD would take over the building of permanent bridges and the general maintenance of roads, but it was a long time before it could undertake the work. Motor roads did benefit the local people, and with the growth in the size of districts and increase of native appeal courts, the chiefs appreciated motor transport which reduced considerably the time that they were away from home.

An interesting example of Sudan government participation in a vital military project was the case of AFLOC (African lines of communication). On 3 June 1942 Tobruk fell to the Germans, the Mediterranean was virtually closed to Allied shipping, while Japanese submarines in the Indian Ocean endangered shipping trying to get to Suez or Port Sudan. To make it possible to obtain the trucks for the Eighth Army and the war in Burma, it was decided by the highest Allied military authority that the least hazardous way to get the trucks into Africa was to send them from the United States to the former Belgian Congo where they would be trans-shipped by river to the head-waters of the Welle river and thence by light railway and road over the Nile-Congo watershed to Juba. At the end of 1942, when serving as an officer in the Camel Corps, I was ordered to fly to Juba where there was a crisis in AFLOC. The Civil Secretary, Sudan government, was exercised over the large number of African labourers imported for work on the road, and the military command in Khartoum was worried over the delay of AFLOC in improving the road for the trucks to come from Aba to Juba. I was instructed to write a confidential report on the widening and improving of the Aba/Juba road and make recommendations on

how to speed up the work. On arrival at Juba I learnt that the widening and improvement of the road was the responsibility of the Royal Engineers and Pioneers who in a dual capacity were responsible for 5000 African civilian labourers recruited for the work. These labourers were stationed, some in a quarantine for relapsing fever in Juba, the rest in camps each of 500 men along the road. In these camps were a Pioneer and/or Royal Engineer other ranks; the Pioneers were responsible for running the camps while the Royal Engineers supervised the work of the gangs on widening the AFLOC road.

After inspecting the road with the Area Commander I reported that the labourers in the camps were obviously under-employed and should at once be put on to task work. The other ranks could speak only English, a language unknown to the workmen, and there were few interpreters. The Royal Engineer officer in charge of roads went sick and was not replaced. As far as I remember, no officers lived on the road but slept in Juba.

As a result of my report and recommendations the gangs were put on to task work. In view of the illness of the Royal Engineer officer and the insufficiency of interpreters I got the Area Commander's permission to live on the road, and I stayed in a hut half way to Aba and inspected the work in a jeep. A senior Royal Engineer officer built a large permanent bridge over a stream which cut the road. Later a newly-appointed Commandant of Pioneers camped on the road from time to time. The work was progressing reasonably well and the trucks kept arriving at Juba, but by May 1943 the strategic need for AFLOC ceased.

In 1946 I was asked to take over temporarily the Sudan Office in London. One of my duties was to deal with many who wished to emigrate by motor vehicles to South Africa or the former Rhodesia via Egypt, the Sudan and Central Africa as they could not get passages on the overcrowded immediate post-war steamers. If they were authentic travellers to destinations beyond the Sudan the policy of the Sudan government was to allow them transit facilities after I had carefully warned them of the inescapable difficulties and possible dangers of travelling by car across the Sudan. They were told they were about to traverse approximately 2850 km over rough roads and, in some places, no roads at all.

Notes

1. The original version of this paper is considerably longer and is deposited in the Durham Sudan Archive.
2. Stigand, C.H., *Administration in tropical Africa* (London, 1914).

SUDAN TELECOMMUNICATIONS IN THE TWENTIETH CENTURY

F. G. W. Hobro

The telegraph network built by the old Egyptian government linking the chief towns of the northern Sudan with Cairo was destroyed by the Mahdists between 1882 and 1885 in their victorious advance. Consequently the new Anglo-Egyptian government had to start from scratch. An early priority was to establish telegraphic communication to Cairo from Khartoum. The route followed the course of the Nile - Atbara/Abu Hamed/Karima/Merowe/Korti/Dongola to Wadi Halfa and hence onward to Cairo. It was known as the 'Dongola loop'. It consisted of a single galvanised iron wire with a gauge of 400lb weight per mile. Relaying sounder equipment was installed at Wadi Halfa and Merowe, which boosted the incoming signals. Such a circuit very soon was overloaded with traffic being passed at around 20-25 words per minute. By the use of connection panels with plugs and cords it was possible to cut in to the circuit by intermediate stations at fixed times to clear their messages. Telegraph poles were generally spaced at 20 poles per kilometre, and it was a task to transport line stores in primitive conditions - approximately 30,000 poles and nearly 200 tons of galvanised iron wire, to say nothing of the accessories, insulators, fittings, stay wires, etc. from Abu Hamed. Inspection of the line was carried out by a linesman on a camel or donkey, and interruptions could take several days to repair.

Eventually the Department of Posts and Telegraphs assumed responsibility for the general work of communications. Long distance telegraphic and telephonic overhead trunk routes were built following the railway routings. A more direct route was established which gave a shorter circuit to Cairo from Khartoum and also allowed the use of duplex equipment (working in both directions simultaneously). This released the 'Dongola Loop' to local area traffic.

Internal communication

In the early 1920s each project had to justify itself as a revenue-earner. Very slowly small magnetic exchanges were installed at the larger towns and villages, mainly to give a local service to the various departments. Khartoum had a Central Battery Signalling exchange (No. 1) which mainly gave service to government departments and a few of the larger commercial enterprises and

merchants. The military had their own internal branch exchanges which were linked to Khartoum Posts and Telegraphs Administration Exchange. A small exchange existed at Omdurman, linked to Khartoum.

With the further expansion of the Sudan Railways an additional trunk telephone circuit was built, together with single telegraphs to Atbara and Wadi Halfa and Port Sudan. At Wadi Halfa a relaying sounder was used to boost the telegraph signals and for a time a Wheatstone automatic sender was introduced to Khartoum. This, by use of a Wheatstone perforator, allowed several operators to prepare perforated tape and then send it at a faster speed by means of the Wheatstone transmitter. Received messages in Morse were fed to a Morse printer which transcribed into normal script. (The automatic Morse transmitter was activated by winding up with a crank handle a form of clock-type mechanism similar to the principle of the old fashioned grandfather clock - a weight, and by means of suitable escapements and adjusting levers the speed could be varied.) Unfortunately the equipment did not stay long in service for several reasons, among which was the long line problem and the inability to get the maximum speed transmission. Messages could be in Arabic, coded Morse or English. At the time there were no Arabic keyboard perforators or printers, so there were difficulties in separating the traffic.

The development of Sudan Railways called for additional circuits for their own exclusive use. An agreed policy was established whereby the Department of Posts and Telegraphs would erect and maintain the overhead routes, whilst the Sudan Railways would provide their own staff. This proved a very satisfactory arrangement, particularly as Sudan Railways were able to obtain the funds for the line materials in their own budget. At the same time during new construction the Posts and Telegraphs administration could make additions on their own account.

When a telephone trunk was erected, it was usual practice to introduce ratio one to one line transformers at various main post offices - Khartoum, Shendi, Ed Damer, Atbara. By connecting a 'centre tap', a half phantom circuit was obtained whereby a telegraph Morse circuit without interference to the telephonic channel was obtained and with an ohmic resistance equivalent to a 400lb copper circuit. Where two similar gauge trunks were available on the same route it was possible to obtain a second half phantom by additional transformers and so provide a (full phantom) trunk, and even a half double phantom for telegraphs. Wherever practicable this was done. With very long lines this circuitry has its own problems. The disconnection of one conductor or the short circuit of a pair, for instance, results in serious Morse telegraphy interference which disrupts the telephone channel. Where such faults occurred, it was usual to cease the telegraph working until line conditions were restored.

In order to obtain ideal conditions, line wires had to be well balanced for their electrical characteristics - ohmic resistance, capacitance, leakance and

inductance. This was generally maintained by transposing the pairs at predetermined intervals, maybe four, eight or sixteen kilometre sections. In the main the Northern Province was generally affected by failures of soldered joints, the wetter regions by broken insulators.

In the early 1940s a new gauge wire was introduced - 224lb bronze. There being little alternative in the war years, it became necessary to ensure it did not get mixed with the existing 200lb copper routes. It was similar in diameter, being bronze was slightly harder, but to many of the less skilled linesmen presented problems. Later with the introduction of a still larger gauge on one route for technical reasons a special slot gauge was introduced for linesmen to overcome the difficulty in sorting out the respective gauges.

With reference to phantom circuits it is pertinent to mention an ingenious device, simple but effective: the phantophone. This instrument was used extensively within a limited range of post and telegraph offices with only a single telegraph circuit, or maybe restricted time sharing on a longer distance line. The instrument was a one-wire earth return, the line was connected to the telegraph circuit through a filter unit (then known as a separator). Signalling was done by means of a very high pitched buzzer, giving one, two, three or four 'toots' according to the office required. The signals did not interfere with any Morse signalling and neither did the speech interfere with the Morse traffic. These phantophone circuits were not connected to exchanges but purely served as an intercom between Postmaster/Telegraphmasters and linesmen in the area. Earthing was always a problem, but although speech repetition and much shouting into the transmitter set was usually necessary, they were better than nothing. Around the time of the outbreak of war a trunk circuit was established to provide connections from Khartoum to Atbara and from there to Port Sudan and Wadi Halfa. A spur at Haiya junction gave connection to Kassala and linked up with Sennar and Wad Medani.

In Atbara the Sudan Railways had their own internal switchboard which had tie lines to the Posts and Telegraphs for access to their subscribers and the trunk circuits. In Atbara there was a 'two-wire repeater' switched by means of plugs and cords to boost through connections. At the best of times 'two-wire repeaters' are problematic and require a very carefully balanced internal network which should match the line conditions either side of the through circuit as accurately as possible. If this is not done then the circuit becomes unstable and oscillates (or in telecom jargon 'sings'). There were great variations both in line conditions in the different areas of the Sudan and in electrical values of resistance etc. (the writer has recorded as much as a 12 per cent change between midday and midnight conditions). In order to avoid oscillation (singing) which completely prevented the use of the circuit and could upset adjacent circuits on the same route, it was essential to make a compromise fixed average balancing network and at the same time reduce the amplification of the repeater to

maintain a reasonable degree of stability. Of course, with more stable lines (cables for instance) much better results would have been obtained, but this would have been far too expensive.

At Haiya junction there was a unique one thermionic valve repeater which operated off dry cells. For a single valve unit to operate satisfactorily it must be placed at a central position in the route, whereby no artificial balance is required, one acting as a balance for the other. However this particular unit gave a very modest boost to the circuit to Kassala.

Line construction work was beset with difficulties. The working party often started at 5.30 a.m. and shut down around 10.30 a.m. because tools and line material were too hot to handle. They then resumed for an hour or so in the late afternoon. Except for very urgent work, most major works were closed for the hot weather season. Termites were a big hazard generally in spite of well creosoted poles, of which ants soon took their toll. Often the heat seemed to drive the creosote into the poles, and blowing sand built sand drifts which the termites quickly climbed to gorge on the poles some five or six feet up. In Kassala Province iron poles were used extensively to overcome this problem, but heavy rains caused other difficulties. Broken insulators gave rise to earth conditions on the lines to the iron poles, whereas in the wooden poled areas such serious faults did not arise. It was difficult to decide the better of two evils.

With the early development of radio communication, it was decided to use as much radio telegraphy as possible, chiefly in the southern Sudan and Kordofan. Main centres were set up at Juba, Malakal, Wau and El Fasher, each with radio telegraphy to Khartoum and other suburban townships. Small manual exchanges were set up to give telephone connections to local subscribers, but no trunks to Khartoum. From each centre odd single line circuits were set up to give Morse key and sounders wherever possible. Port Sudan radio station was established to give service to shipping in the Red Sea. During the war direction finding stations were set up (Gonio) which pin-pointed the whereabouts of aircraft in Sudan air space and rendered invaluable assistance to the RAF and other allied aircraft.

One of the most important steps forward was the introduction of an automatic telephone exchange in Khartoum, which accommodated 800 subscribers. This was around 1937. The old Central Battery Signalling exchange was recovered and one suite went to Port Sudan and the other to Wad Medani. These gave invaluable service at the new locations until they were replaced by automatics.

Addendum humoresque: When Khartoum exchange was converted to automatic working, numerous complaints arose about wrong numbers by Sudanese subscribers. When quoting a number in Arabic it is normal to conclude in the biblical fashion ('four and twenty' meaning twenty-four) hence they dialled 42 instead of 24. When automatic exchanges took over in Port Sudan and

elsewhere due note was taken of that problem and subscribers were educated by model exchanges and propaganda well in advance. Numerous poles collapsed at their staying points. At such points an anchor plate of galvanised iron about 18 inches square was attached to stay wire buried four to five feet in the ground. Certain nomadic tribes found these a useful addition to their culinary equipment. When placed on four gallon petrol or paraffin tins, they were great for cooking *beladi* bread, serving as good hot-plates!

External links

This was probably one of the first major developments in Sudan Telecoms, and merits discussion at some length. For many years merchants, business houses and others had often expressed a desire for communication between Cairo and Khartoum by use of a telephonic link. Before World War II speech over a distance of 2000 miles by overhead lines was out of the question for technical reasons, and although in the decade 1920-1930 something could have been introduced, the enormous capital costs involved would not have made it an economic proposition at the time, when money was needed for further development of internal works. Demand continued and in 1938 the Director of Posts and Telegraphs, accompanied by the Chief Engineer, visited Cairo for an international telephone conference and took the opportunity to discuss the matter with the Egyptian Posts and Telegraphs. After careful study of radio and overhead lines it was agreed that a three-channel open wire carrier system was the correct solution. The cost estimated then was around £37,000, of which the work to be done in Egypt would account for £14,000, the remaining work in the Sudan being £23,000, in addition to which the Sudan would have to spend around £E11,000 on certain line renewals, some of which were already due to be carried out. Although the Egyptians thought the system would give a handsome and quick return, the Sudan considered the estimated return over-optimistic.¹

In the summer of 1939 the Posts and Telegraphs were instructed to resubmit proposals, and the project was included in the 1940 budget. Negotiation began with the Egyptian State Telegraphs for the placing of the order for the carrier equipment as it had been deemed more appropriate for joint orders to be placed irrespective of where the equipment was ultimately sited. Meanwhile work was started on the Shereik/Abu Hamed section making use of such stores as were immediately available in the country. But stocks of materials were dwindling and the work, not considered as a military necessity, was halted. By July 1940, however, this decision was reversed due to the Middle East situation and the Asmara campaign and the section, Shereik/Abu Hamed/No. 10 station was completed. The working parties were then switched to provide trunk lines round the Kassala loop, double trunks Khartoum/Port Sudan and triple

Khartoum/Atbara. For Sudan Railways a train control circuit between Atbara and Port Sudan became essential. It was not until the Autumn of 1941 that the parties were able to go back to the Abu Hamed section and even then were only indirectly concerned with the Cairo system. A military trunk was urgently needed by the Army between Atbara and Wadi Halfa. Unfortunately such circuits did not appear like a rub on Aladdin's lamp, so by the time it was ready for service several months later the trunk was handed over the Posts and Telegraphs for use as an ordinary trunk circuit for telephony. Sudan Railways, with military backing, requested a train control circuit from Atbara to Wadi Halfa in 1942. It was finished in 1943, by which time Sudan Railways announced they would only require the Atbara section to Abu Hamed.

About this time it was decided the military would supply the carrier equipment from their own Middle East stocks, and in due course crates began to arrive in the Sudan and the Egyptian State Telegraphs. Alternative proposals circulated for about three months regarding the siting of the equipment, but in the end the original plan was followed with the exception of the transfer of the repeater station to Abu Hamed.

By May 1943 line work in Sudan (and in Egypt) was complete and equipment awaited and tentative plans for power supplies were drawn up. In wartime little else could be done. Khartoum, having an AC supply, presented no real problems; Atbara and Wadi Halfa had DC power; Abu Hamed NIL.

In the Sudan Posts and Telegraphs department the writer was the only engineer familiar with multi-channel telephony and telegraphs. With the ultimate arrival of equipment, two Royal Signals commissioned officers and two NCOs came to give assistance. This was invaluable. The equipment required 24 volt and 130 volt power supplies (DC). At Khartoum it was possible to use rectifiers and batteries. From Atbara and Wadi Halfa, DC motors were used to drive suitable generators, suitable pulleys being manufactured in the Posts and Telegraphs workshops to give the necessary coupling. Two army portable petrol-driven 24 volt generators were installed at Abu Hamed. Power panels and distribution boards were manufactured from bits and pieces and eventually the installation work got off the ground. The Sudanese staff who accompanied the team did a really good job and frequently worked well into the night when the weather was much more pleasant.

The system was ready for service in 1944. It came well up to expectations and it became possible to introduce a special unit whereby each speech channel could also carry duplex telegraph channel without any appreciable effect on the voice transmission. Thus the system finished up with three telephone trunks to Cairo, plus three duplex telegraphic channels and of course the plain physical channels and half phantom. The military were allocated one channel to Cairo (plus the duplex telegraph) which they soon put into service. Unfortunately it was not officially put into service between Sudan Posts and Telegraphs and the

Egyptian State Telegraph until May 1945 (King Farouk's birthday). It was remarkable to see two newspaper boards outside the leading Khartoum hotels: KHARTOUM PHONE LINK OPENED and 2,000,000 GERMANS TRAPPED BY ALLIES. Very soon afterwards, it was possible to make calls to the United Kingdom via Cairo from Omdurman and Khartoum - a really big step forward.

Automation

Although some 800 lines of automatic equipment had been installed prewar, it was impossible to obtain additional equipment to expand this. However it transpired that several cases of equipment had suffered sea-water damage during the original transit to the Sudan and had been written off and replaced. In desperation therefore these racks of equipment were set up and after many hours of careful cleaning were put into service and gave some small relief around 1943. With the additional trunks an additional single trunk position was made up from spare bits and pieces so that two operators could handle the traffic. With the end of hostilities in Eritrea, a welcome contribution to the Sudan's diminishing spares was a large consignment of captured Italian telephone instruments (magneto) and portable magneto field exchanges which were very soon installed and gave useful service to some of the small townships.

Around 1937, an experimental batch of teleprinters had been introduced but as the lines were not good enough at that time they were not put into service. The military did operate such a machine between Atbara and Khartoum, but at times the interference on the telephone circuit was very severe. In 1948, however, when the Sudan Railways had their first strike, the Posts and Telegraphs took several of the teleprinters out of storage and set up a circuit from Railway headquarters to Khartoum.

Soon after the end of World War II, plans were set up for the installation of automatic exchanges at Port Sudan, Atbara, Wad Medani and El Obeid, together with a long needed large extension to Khartoum and Omdurman. New buildings were needed in the provinces and alterations at Khartoum. With the programme of automation afoot, it was also necessary to improve the trunk network. A carrier system was introduced to Port Sudan, El Obeid, Wad Medani and Atbara.

Whilst these works were under way, the role of Radio Omdurman should not be overlooked. Regular broadcasts were maintained during the wartime conditions, and as domestic radios were at a premium, central receivers in the provincial towns were provided with tannoy speakers which gave regular bulletins. Gonio stations were installed and staffed by Posts and Telegraphs and gave valuable information on aircraft dispositions in the Sudan airspace and were in close cooperation with the RAF and Allied air forces. The

Meteorological service was also a Posts and Telegraphs department and gave valuable weather information at regular intervals, which was collated in Khartoum. Balloons inflated with hydrogen took up Radio Sonde equipment which sent back by radio signals details of air speed, temperatures and humidity.

Most of the overhead line stores - wire, poles, insulators and fittings - were held by the District Engineer in Atbara, as an outpost of the main store in Khartoum. In 1947, the Governor of the Province, talking informally to the author, asked why he could not get a telephone trunk to enable him to speak to his offices in Merowe from Ed Damer. (It is of course sad to report that in many instances Governors were not in favour of the development of telecommunications which could give them too close contact with HQs by telephone.) The author said there was no problem if money was forthcoming. Adequate stocks of material were lying dormant in Atbara; all that was needed was the funds to pay staff. This informal chat resulted in the author's being dragged over the carpet because the Governor thereupon demanded a trunk telephone connection to Merowe and quoted the District Engineer Atbara as having said it could be readily arranged! The Chief Engineer relented with the proviso that if it was not done in the estimated time the author could be looking for employment elsewhere. The project was completed on schedule and the Governor cooperated by diversifying a small school building for the accommodation of the manual exchange switchboard powered by a wind charger. With an already-existing speech circuit by marine cable (Karima/Merowe) a telephonic link was established to allow communications to Ed Damer, plus an extra Morse channel.

In the early 1950s a single side band link was established Khartoum/Juba. This proved to be somewhat temperamental, one problem being that if caller and called spoke simultaneously the circuit chopped, which to the ordinary user was very frustrating. World information on radio transmission in central Africa was limited, and it was thought that the vast difference in climatic conditions existing between Khartoum and Juba would give rise to atmospheric interference which could only be overcome by experimenting with varying frequencies - a difficult problem with only one circuit.

In the middle and late 1950s, with the continued expansion of the local networks, traffic increased beyond all forecasts and the three-channel systems were gradually replaced by twelve-channel apparatus. Khartoum Central was under more or less continuous expansion. New exchanges were built and opened at Omdurman, Khartoum North and Khartoum South.

Sudanisation

At about the time of Sudanisation, when most of the expatriate engineers were

leaving, the Director (Sayed Suleiman Hussein) decided to introduce a teleprinter service between Khartoum/Cairo/Port Sudan/Atbara/Wad Medani and El Obeid. The author was then the Principal of the Posts and Telegraphs Training School and it was agreed that for an interim period the school would take over this particular phase of the project and be responsible for the testing and installation of the equipment and routine maintenance. This had the advantage of our being able to train new engineers in all aspects of the system. From time to time teleprinters were brought back to a special workshop at the school for maintenance or overhaul.

All went well, and very quickly we had English and Arabic teleprinter circuits operating and also a link to Eastern Telegraphs Port Sudan (now Cable and Wireless) which was connected by high-speed telegraph equipment over their marine cable network to Cairo, Aden, etc. They also operated a radio circuit to Jeddah. Demand increased and a small manual telex exchange was installed allowing commercial houses to get in on the network at Khartoum and Port Sudan. A direct link was established between Khartoum and the United Kingdom (and Europe via London). On this particular radio link, error correcting equipment was installed (ARQ).

Punched tape perforators were available with the teleprinters used by telex subscribers, which gave them the advantage of preparing messages in advance, and by use of a tape transmitter they could get their script away over a long-distance line at around 65 words per minute. Over the public telegraph network, keyboard perforators were introduced so that operators could prepare a batch of telegrams and then send them continuously over the main public channels. A link-up with Nairobi was also established. In early 1960s an automatic telex exchange was installed in Khartoum which catered for both English and Arabic script subscribers. This was possible by skillfully allotting the numbering scheme of the exchange.

With more funds several other works progressed. A VHF relay station was set up on Gebel Marra (about 11,000 ft). This enabled a network to be established linking up by phone and telegraph Kordofan/El Fasher/Geneina/Kadugli and El Obeid. The station at Gebel Marra was unique in that it was self-supporting for power from a small stream which, with suitable blocking and piping, enabled the installation of a small turbo electric unit. At Haiya, Berber, Ed Damer and Karima, windchargers were erected to supply the necessary power for the small manual exchanges. The Gezira network gradually became automatic with the installation of Rurax equipment. Radio Omdurman was expanded and apart from a teleprinter news network opened up television around 1962. A new Posts and Telegraphs radio station was set up beyond the airport at Sobat. Communications of course developed to provide

service to New Halfa and Roseires where exchanges were very quickly set up for contractors. A teleprinter circuit to Khartoum was also installed. A reserve machine was held at New Halfa.

Soon after Sudanisation, IAL was taken over by the Posts and Telegraphs Department and became responsible for ground-to-air navigational equipment. IAL however, continued to maintain the actual airborne equipment on aircraft, and several of the IAL staff were seconded to the P and T which then formed the Airadio Section. Miscellaneous services provided were the supply and maintenance of mobile radio for police and for pest control during the locust seasons. Unusual tasks included the laying of marine cables across the Nile or Port Sudan harbour, improvising and adapting local barges or rivercraft to suit the cable drums some of which, if of a heavily armoured type, could weigh around 15 tons.

Following Sudanisation several senior engineers were retained and rendered invaluable service by maintaining continuity in the very rapidly growing development. Loans boosted our ability to import essential equipment from abroad. After 1960 a large expansion became possible by a loan from the Royal Netherlands sponsored by Philips.

The Training School

The writer became Principal in 1951. Basic training had previously been given to linesmen and cable jointers, mainly in the field by more senior artisans. Mechanics were taught by expatriate staff to repair telephones and simple maintenance of exchange equipment. The Posts and Telegraphs workshops, also under the auspices of expatriates and several good Sudanese foremen, performed the more intricate repairs to telephones, portable equipment etc. and with the assistance of an expatriate radio engineer and Sudanese inspector quite often manufactured radio transmitters and receivers etc. Most of the linesmen however, had no knowledge of English and few could write Arabic.

It became obvious that in order to cope with the more advanced equipment, a higher standard of education was required and a knowledge of English essential for the study of brochures, handbooks etc. In the first instance apprentices were recruited from fourth year intermediate schools. A few years previously several telephone operators and supervisors had been taken into the engineering service as a nucleus force during the installation of carrier systems and new exchanges. Several others were taken over later. After the new school was set up in a large private house in Omdurman, two extra expatriates and two Sudanese inspectors, a leading linesman and a cable jointer were recruited and the school got under way.

Cable jointing and line courses, including subscribers' equipment, were held. For the budding engineers an introductory course was held for about 24

students following the syllabus adopted by the British Post Office with the curriculum modified to suit Sudan conditions. At the end of the course the student's were sent to various districts to gain field experience in either automatic exchanges, radio stations or carrier repeater stations. Regular reports from the engineers in the districts were carefully preserved in the students' personal file at the school.

The early part of the introductory course gave the students basic instruction in soldering, wiring, overhead construction, underground cable work, subscribers' instruments etc. All this gave them a good insight into telecommunications and fitted them well for future responsibilities. They were budding engineers and would with good progress become district engineers, etc. Most of those early trained students now hold very responsible posts. Field training was quite often possible during the course. Invaluable support was given the local engineers by providing dressed poles with fittings, cable terminal stubs etc. After several such courses and a reasonable period on field work it was possible to run courses on automatic telephony and carrier telephony (included in which were a few students who would become radio technicians) and teleprinters.

Little by little, funds were obtained with which test gear and equipment were purchased for school use. A complete carrier system was donated by Standard Telephones and Cables, giving invaluable practice for the students. Two model auto exchanges were set up and finally special selector switches were supplied similar to those in the field (except that they had 'u' links which could be moved around and simulate types of faults usually experienced in the normal exchange switchgear). A large cabinet of radio panels was obtained on which, by means of inserting plugs and cords, a variety of radio circuits could be set up. For simplicity and to help students, each circuit had its respective schematic diagram engraved on the front of the panel.

A more commodious school was eventually built in Khartoum and as the output from secondary schools stepped up, by around 1960-61 recruitment was only from fourth-year secondary schooling. Encouragement was given to students who achieved good results by selecting a few for further training abroad. Pending the building of the new school in Khartoum South, the Training School was transferred from Omdurman to more commodious premises at Khartoum East, where it became possible to accommodate sixteen students from Saudi Arabia for overhead line, cable jointing and subscribers' apparatus training. Sixteen students were also brought in from southern Sudan for line and cable training.

The United Nations eventually took over the Training School under the auspices of International Telecommunications. By special arrangement the author was allowed to stay as Principal of the school pending a Sudanese successor. Unfortunately, the United Nations seemed to adopt a rather more

academic approach to training than a down-to-earth practical one. The author was then drafted to other duties, finally assessing the Posts and Telegraphs main stores where an abundance of untapped stores were found, sadly dormant owing to the departure of so many engineers with Sudanisation. In fact it was like an Aladdin's cave. There was even one case of equipment which had been mislaid from the original three-channel system in Cairo!

Note

1. The original paper gives the technical details of the joint scheme and appends a technical bibliography.

IN DISCUSSION: COMMUNICATIONS

(Chairman: Richard Hill)

Michael Barbour: Do people now think that the Sudan and Egyptian railway systems should have been linked by a line rather than by a steamer, that is the Sudan Railway at Wadi Halfa and the Egyptian State Railways near Aswan?

Richard Hill: Here I can be just a little dogmatic, perhaps for the first time in my life. Lord Kitchener was a careful man; he never spent a penny more than he need even in the heat of action, when he reproved an artillery commander for the excessive use of shells. When he came to Wadi Halfa he saw there a convenient nest of wagons, in quite good repair and four or five locomotives with three foot six-inches gauge. Journalists took this up to mean that Lord Kitchener with great foresight was arranging a gauge similar to that of Cape railway and that ultimately the line would progress to South Africa. That is romantic journalism; the rolling stock and locomotives, 30 miles of track laid down and about the same amount of sleepers and rails ready for laying, decided Lord Kitchener to begin humbly.

Mekki Al-Sayed Ali: In 1949 surveyors surveyed the line from Egypt to Wadi Halfa and the general-major of the Egyptian State Railways and his chief engineer visited Halfa to meet the general-major of the Sudan Railways and his chief engineer to agree on the site of the transshipment station. That was studied with maps and everything, but I think because of the difficulty in providing the funds and the money it was neglected.

John Wright (1939-1955): Two points: During the war I was asked to write a revised route book of Eritrea and I published in it a little key map showing the railways in Ethiopia, Eritrea and the Sudan and I remember thinking some Brigadier or Major-general will suggest that they be joined up, so I put in a little note 'the three lines are of different gauges'. As to the linkage: one should remember that Wadi Halfa is now under 70 feet of water and that any line which was likely to have followed reasonably near the course of the river would have been completely submerged by Lake Nubia or Lake Nasser.

Robin Hodgkin (1939-1955): The question highlights a problem that affects most developing countries: that their educational system develops too much on the rather split pattern which has grown up rather disastrously in Britain in which academic Oxbridge-style education is too clearly marked away from the Crewe-type technical, Derby-type engineering education. I don't think it is so important that Atbara was a few miles away from the capital, but psychologically it was too far away from the youth of the Sudan.

Gerard Wood: We did of course have a batch every year of engineering students from Khartoum University and of course the Atbara Technical School

trained people who went all over the place outside the Railways. In the University itself there is an Atbara-trained man doing a lot of useful work so perhaps there was some cross-fertilisation.

Morris Lush: I believe it would have been better if Atbara had been stationed or put down much nearer to Khartoum, much nearer the centre of government, just like the headquarters of the Sudan Defence Force, just like the headquarters of all departments.

John Wright: Mr Hawes mentioned that two Doves were fitted with cameras. I actually started this. What we did was to get two of the Doves modified so they had a hole in the floor and extra tanks which could be put in in about five or six hours' work so that they could be used for normal services, and when we wanted them we could get them for aerial surveys which was a great boon because the Sudan is so flat that every aerial photograph was virtually a map. The government wished to do something about rectifying the Baro salient because the boundary between Ethiopia and the Sudan in the Baro area between Gambeila and Lake Rudolph cut two kinds of tribes in half, passing over the flat iron and also over the high land. The government tried the RAF from Nairobi, and then they tried a commercial company who wanted £20,000, and I said, 'If you let me have £2000 to buy a camera and modify the Doves, I will do it and you will have the Doves and the camera at the end of it.' We did a lot of photography but this was only part of the story because there were tremendous areas covered by the Americans with three-camera photography at a great height from Flying Fortresses, which we used a great deal for things like the Jonglei scheme.

Ronald Keymer (1946-1963): At the end of the Condominium period there just weren't roads in the Sudan except in the towns. Now from a business point of view we got most terribly held up by the amount of capital that was locked up by delays at Port Sudan. We had to run convoys of vehicles across the desert from Port Sudan to Khartoum, and it really was a very tough journey.

Stewart Macphail (1922-1947): People are too pessimistic about this question as if there were no roads outside the towns. Well I deny that. The opening of the road from the Blue Nile boundary down to Malakal was initiated by Mr Nicholson and finished by me and that road was open in dry weather. I made a trace for the South African army from Atbara and up to Abu Hamed and then on to Wadi Halfa as General Smuts wanted all his transport after the end of the war in Abyssinia to go up on its own wheels through the western desert. The Sudan roads were very rough, but it didn't stop all the transport of the South African Army.

Reginald Dingwall (1931-1954): I constructed a road 70 yards wide for the military from Kassala to Abu Deleig. I think it cost us £100. I also constructed a road from what John Gowing described as 'Mus-bloody-mar' to Halaib which was the part of Egypt which we administered on the Red Sea coast, and that cost

a road from what John Gowing described as 'Mus-bloody-mar' to Halaib which was the part of Egypt which we administered on the Red Sea coast, and that cost £300. The first car down it was my *merkaz* lorry and the second was the Governor-general's Rolls-Royce. And if the Rolls-Royce could get round on that sort of road, I think it is quite wrong to say there were no roads in the Sudan.

Sirr Al-Khatim Al-Khalifa: We now feel very much the lack of any energetic road policy during the Condominium. We are now faced with heavy traffic from Port Sudan to Khartoum and between Khartoum and Juba and this has been a very great factor in holding up development in the Sudan and increasing the costs of life ... Another thing which was rather neglected during the Condominium were roads which would have helped the development of trade, commerce - which would have helped the farmer to take his products to the market.

Reginald Dingwall: My recollection is that there *was* a roads policy during the Condominium period. It was to concentrate roads where the Sudan Railways did not run. There was quite a comprehensive road system in the southern Sudan and there was no road system between Khartoum and Port Sudan because the Sudan railways before the war was able to carry all the produce that came to and from that port. It was felt wrong to compete with Sudan Railways by building roads because money was terribly short. Whether the Condominium government should have foreseen the enormous development in money and traffic and trade is perhaps another matter.

Stewart Macphail: The difficulty was not so much government policy but the geographical fact of the White Nile flood.

Judge Mohammed Ibrahim Al-Nur: The difficulty now is in the North not the South.

Part III:
MEDICAL SERVICES

THE MIDWIVES' TRAINING SCHOOL AND THE DEVELOPMENT OF A MIDWIFERY SERVICE IN THE SUDAN DURING THE ANGLO-EGYPTIAN CONDOMINIUM, 1899 - 1956

Dr A. Cruickshank

The practice of midwifery in the northern Sudan was long considered an honourable vocation as well as a hereditary profession for elderly married or widowed women who had borne children. Great age and even blindness were no handicap, since midwives were expected to deliver by feel and not by sight. Age-old traditions and customs were jealously guarded in this almost closed profession.

The main custom which was to hinder progress in developing a midwifery service, was the almost universal barbarous and mutilating pharaonic female circumcision. The operation is carried out on young girls, usually around the age of six, and the permanent injury, both physical and mental, caused by it persists all through their lives. It is the cause of one-quarter of all cases of infertility and barrenness in the northern Sudan. It results in untold miseries and morbidity, delays and complications at each confinement and after it.

It was realised early on that female circumcision had become part of the social structure among the Islamic peoples of the northern Sudan. Until an anti-circumcision attitude was sufficiently strong, any suggestion of legal change would be tactless and ineffective.

The government decided to push ahead with social reforms, with the development of a nation-wide midwifery service, leading to the organisation of a comprehensive programme of social welfare including ante-natal clinics, child welfare clinics and the overall services of health visitors.

Traditional methods of delivery

The usual method of delivery as practised by the old illiterate midwives, was the *habl* or rope.

At the start of labour a rope was slung from the cross beam of the room, or from a support of the grass roof of a hut. Beneath this a small circular hole was dug to collect blood and discharges. Over the hole was placed a special circular reed mat, with a central aperture the size of the hole. Rarely, if a mat was not procurable, the area around the hole was sprinkled with clean sand.

The midwife sat with her bare legs straddled across the hole and the woman in labour clung to the rope and stood, squatted or knelt between the midwife's legs, and was delivered by feel, under cover of the patient's *tobe* (a loose cotton wrap worn by the woman).

In the circumcised it was usually necessary for the midwife to incise the scar tissue resulting from the infibulation in order to give sufficient room for the birth. This was done by an ordinary razor, the blade of which was bound with tape to within half-an-inch of the tip. There was no attempt at sterilization; the same tape remained unchanged for months.

One vaginal examination done by the midwife with the middle fingers of her left hand usually sufficed, but if the labour was prolonged, any available midwife, or even all the elderly ladies present, would have a go in the hope that one of them might be inspired by Allah to produce a successful outcome. Septic complications were apt to follow.

The *habl* position did not promote ease of labour. In it the patient tended to lean forward and the axis of the foetus was thus directed backwards causing delay and painful sacral pressure. The old midwives had surprisingly little knowledge regarding true labour pains, and especially with primiparae they were apt to start off their patients in the *habl* position far too soon. It was rare that the patient was then allowed to relax, and neighbours (and even men relations) took it in turns to hold up the exhausted woman. It was thought that the foetus might be suffocated if the mother rested or sat down. Authentic cases of labour lasting ten days have been reported.

Midwives considered the third stage of labour the most critical and dangerous, not because of possible haemorrhage, but from fear of retained placenta which, if left, would rise up to the woman's heart and suffocate her. Many heroic devices were in use to hasten the expulsion of the placenta, such as attempting to swallow a rosary to provoke retching, making the patient blow into an empty bottle or into her fists, or forcing her to drink a pint of liquefied butter, or by strong repeated manual pressure on the abdomen. The placenta, after examination, was buried in the hole, which was then filled in.

When slitting of the perineal scar had been done, the wound had to be stitched and this was usually crudely done. One method was to use long sharp thorns which were pushed through the edges, and the tips tied together with thread.

Births, marriages and deaths, were important social events, and all the female relatives and children who could come were present at the actual delivery, not so much to witness the birth as to share in the divine blessings, for the gates of heaven opened and the angels appeared at births. The noise, commotion and chatter perhaps stimulated the midwife to show her skill, and gave the patient courage to endure the ordeal, but otherwise the dust stirred up and the overcrowding were not conducive to good midwifery practice.

Early days

In the 1904 report of the Principal Medical Officer of the Sudan, there is a paragraph stating that in Khartoum that year, eight of the local midwives were given a course of training and five given proficiency certificates. No further reference to this subject appears in the reports until the opening of the Midwives Training School in Omdurman in 1921. The medical budget was strictly limited, and all the energies of the meagre, widely-spread staff had to be concentrated on maintaining the health of the troops and government employees, or containing the serious epidemic/endemic diseases, mainly smallpox and malaria, and in developing elementary sanitation and mosquito control.

It was not till after World War I that the Sudan government could expand its activities. In 1919 a healthy budget surplus enabled a grant to be made to the medical department, which decided that the provision of a midwifery service should have priority and authorised, on an experimental basis, the establishment of a training school for midwives to be sited in Omdurman.

The start

In 1920, Mrs M. Crowfoot, wife of the then Director of Education, witnessed a female circumcision and a native birth, and was horrified and ashamed. Her subsequent persistent persuasion induced the then Director of the medical department to get the formal approval of the Governor-general's Council to take action. Again at the instigation of Mrs Crowfoot, Miss M.E. Wolff, then Matron of a midwives training school of the Fayoum, Egypt, was persuaded to come to the Sudan to organise a school for midwives at Omdurman.

At the time of Miss Wolff's arrival in November 1920, Omdurman had a small government hospital built of mud bricks, staffed by an elderly Syrian doctor, a female Sudanese attendant - kind-hearted, it is said, but frequently drunk - and three untrained *tumergis* (male nurses). A British government physician from Khartoum came over by ferry once a week to inspect the hospital, and to see cases. The female patients consisted mainly of slaves and prostitutes.

Miss Wolff was housed in a Sudanese-type mud brick house with two rooms and a bathroom (without bath) enclosed in a small compound with a tiny kitchen and a servant's room in the far corner. This compound led into a larger one which had two red brick buildings of two rooms each. One was for use as living quarters for the pupils, the other as office, lecture room and patients' examination room. There was also a small mud-built store room which was converted into an emergency labour ward. There were no glass windows, furniture was of the scantiest, water was brought daily by a gang of prisoners,

and lighting was by candles. The roads were unmade and the only means of getting about was by donkey or on foot. When Miss Wolff saw these conditions, and realised she was alone with no staff and that she was surrounded by an atmosphere of antagonism and suspicion, even her stout heart quailed. Besides her courage and determination, she had an invaluable asset - an intimate knowledge of colloquial Arabic including the idiomatic terms of invective and vituperation customarily employed in family squabbles and, more especially, acquaintance with those terms commonly used by the womenfolk to castigate their erring husbands - this she was to use later with telling effect.

The Opening

In January 1921, the school opened. The first term started with two pupils, Nura bint Omar, a midwife of the *habl* school aged 70, and a younger woman, the wife of the *boab* (door-keeper) with no previous experience. Within another month two others were recruited, Aziza Bercy, a 68-year-old midwife and Mastura Khidr, a slightly younger married woman. Mastura, as the only surviving midwife of that first term, became in 1945 the first Sudanese midwife to be awarded a decoration, the British Empire Medal.

An excerpt from Miss Wolff's report on that first term gives an idea of what she was up against:¹

The *daiyas* were unwilling to live in the school, and were suspicious of what the training would mean to their work. The pregnant women likewise shared their views, dreading any interference with their customs - one being that the *daiya* must deliver the women under cover of her robe, by sense of feel only!

At the very first case I attended, and at the critical moment, someone enveloped both the *daiya's* and my head in a *tobe*, and for a few moments we were quite helpless; another trial is the extreme ignorance of labour pains, with the many useless calls this entails before actual labour begins, due to the fear of having no *daiya* present to release the baby at delivery.

For the second term six pupils from Omdurman were recruited. One of those some time later was discovered by Miss Wolff delivering her first school case in a completely naked state, because she did not wish to soil her lovely government uniform (white overalls).

The youngest pupil of this second term deserved notice. She was the widowed daughter of Aziza Bercy. She was a bright, good-looking, intelligent woman called Gindiya Salah, who after her training remained to become Miss

Wolff's first staff midwife. Gindiya Salah, though illiterate, was an excellent practical teacher, and later it was largely through her personality and influence that the strong opposition to doctors or medical students attending any midwifery case was overcome. Miss Wolff tells how she used to arrange for one or two students to hide beneath the back window of her little examination room, and when a patient was brought into the room for her to see, she showed the relatives out, rang a little bell and students nipped in through the window and out again the way they came, before the relatives were allowed back.

Training methods

For illiterate women a simple, practical, repetitive step-by-step programme was essential, and Miss Wolff devised one which was so successful and ideal that it continued to be used by subsequent matrons for years.

Great store was set by personal cleanliness and neatness of clothes, good discipline, and orderly and economical habits.

All medicines had to be distinguished by sight, smell and taste, and their doses and usages memorised. The pupils were later tested blind-folded and, if found proficient, passed on to the next stage; how to prepare a labour room and sterilise and lay out the few pieces of equipment required. It was stressed that out in the country and in poor areas items like tables, beds, kettles, might not be available and that midwives must use their common sense and adapt to the circumstances.

To teach techniques of delivery required some ingenuity. A life-sized plastic doll, called the phantom, and a dummy pelvis were used as models.

The use of scissors and artery forceps, how to prepare and give an enema and pass a catheter, had to be mastered. The teaching, and getting experience, in suturing perineal tears or wounds (inevitable in circumcised cases) presented a problem. This was solved by using slit-up motor car inner tubes. Rows and rows of intercepted stitches had to be needled through the thickness of the tube and firmly tied. Then all these had to be neatly cut below the knot and the stitch removed with a professional jerk.

Each pupil had to see twenty cases delivered either in school or in the district, and then conduct twenty cases under supervision, before being sent out alone. Later, as experienced midwives became more numerous, the novice would be paired with one of them to gain experience.

In the whole of the million square miles of the Sudan there were only nine civilian British doctors at the time of the opening of the school. A simple, efficient method, again devised by Miss Wolff, was adopted for seeking help and at the same time giving basic information about the case. Each midwife carried in her box (see Appendix) two sets of three coloured metal discs. The

first set was - red for urgency, amber - as soon as possible, green - aid required, not urgent. The second set was marked I, II and III to indicate the state of labour.

On successful completion of a six months' course, a certificate to practice midwifery was issued, and the owner was allowed to charge fees. In towns a good living could be made, but in rural areas grants were made to supplement their earnings. Later an inspectress of midwives was appointed.

Development

By 1924, it had been possible to train all the existing old midwives of Omdurman and Khartoum, and it was time to start training women from the provinces. For this purpose, it was arranged that the Matron should make an annual tour to get in touch with the wives of the provincial notables, explain to them the work of the school, and to persuade young women of good type to undergo a course of training, then returning to practice in their own villages.

This programme was adopted with good results. Young women were obtained from all the northern and central provinces and the Matron's annual recruiting and inspection tour paved the way for the adoption of the new methods once the trained midwives returned to their home villages. The conservative influences in these outlying districts were stronger than in towns of Khartoum and Omdurman, and the younger trained midwives met very stiff opposition from the entrenched *dichards* of the *habl*. A visit from one of the Misses Wolff usually carried the day, by their strong personalities, commonsense demonstrations and voluble vernacular Arabic explanations.

Miss G.L. Wolff, sister of M.E., who had been with her at the Fayoum as Matron of the children's dispensary, was persuaded to come to the Sudan in 1925, and was appointed Matron of the Omdurman Women's Hospital, with the main object of training Sudanese nurses. M.E. had a serious illness in 1929, largely due to overwork, and her sister was transferred to the Midwifery School as Matron, whilst M.E. became inspector of midwives. This formidable combination proved a great success, and they became known affectionately as the 'Wolves'. It is said that Director of the Sudan Medical Service, whenever the Wolves threatened to come in union and discuss with him some disputed request, soon learned it was wiser to give way at once as they always won in the end. G.L. once, when she had been warned that a distinguished visitor was coming to inspect the school in two days' time, requested the Director of the Stores and Ordnance Department to supply new materials for her pupils' uniforms, as their old one were in rags. On receiving the usual red tape answer of unavoidable delay, she went in person to the Stores Department and said

'Director, tomorrow morning I propose to bring my 19 pupils stark naked to sit on the steps of your office until I get the material.' The cloth was delivered before evening.

After five years of hard, patient slogging, Miss Wolff reported that 65 midwives had been trained and 31 of those were already working in the provinces. The remaining 34 replaced the old die-hards in Omdurman and Khartoum. It was noted that the opposition gradually diminished and that year by year a better class of woman was coming for training. The system of sending trained midwives back to their home towns was reaping additional rewards as they spread the doctrines of health and hygiene in the homes of their own people, and preached the evils of circumcision. The seeds of a silent revolution had been sown. Amongst the 274 cases delivered in Omdurman in 1926 was the wife of an important Islamic leader and this gave a great boost to the school and the 'new methods of delivery'.

Few women since the days of Miss Tinne and Lady Baker had trekked in the distant parts of the Sudan, and then only with a strong retinue. M.E. (and later G.L.) went alone with one, or at most two, Sudanese servants, and had many a venturesome time fraught with hardship and danger. Even when the motor car was replacing the donkey or camel, the lack of roads and bridges, the temperamental nature of the wonderful 'T' Model Ford, and the dearth of trained drivers made travelling for a lone woman a hazardous undertaking. Accommodation was another problem. Such few rest-houses as were available were poor gloomy mud and grass structures, devoid of furniture. District Commissioners were instructed to facilitate their progress and many a man in charge of a district outpost got a shock when he heard that a lone 'Wolff' was descending on him.

The following extract from a letter from a District Commissioner to his mother, gives an idea of the consternation such a visit caused.

I do not know Miss Wolff, but am sure she is thoroughly amiable and easy to get on with. But why she should elect to arrive at Geneina on Christmas Day, I cannot imagine. She probably wants to write home about how she spent Xmas Day 'in the BUSH' on the borders of French Equatorial Africa.

Also the Sudan is a vast country, covering ONE MILLION square miles. Why should Miss Wolff choose MY square mile for Christmas, when there are nine hundred and ninety nine thousand other square miles that she might have sat upon?

Anyway, that is my Xmas Reward for making a good Motor Road from Fasher. For thousands and thousands of years my lady friends of

Geneina have had babies, and the British Government has never even questioned the ability of the local storks, and the reliability of the Geneina Gooseberry Bushes. Now the British Government sends Miss Wolff to start a new system of Rationalisation and Mass Production.

The 'Wolves' must have got much secret pleasure from watching the transformation of their once unwilling hosts into staunch friends, for these officers quickly realised the great benefit that would accrue from the pioneering work of the 'Wolves' to the communities for which they were responsible.

Ante-natal clinics

In 1930 M.E., after recovery from her long illness, and with her sister to help with the more strenuous duties, decided to develop regular ante-natal clinics in the Sudan. Though by now the Sudanese women were willing to come for help when ill, they could not see the sense of attending regularly when not ill until Miss Wolff explained it this way - 'When you are cooking don't you lift the lid of your *halla* (saucepan) to taste and stir your stew to see that it isn't burning?' 'Of course we do,' they laughed. 'Well, it is just what we wish to do for you and your unborn baby, to see if all is well, in fact a *kashfal halla* of your pregnancy'. From then on the ante-natal clinic was known as the *Kashfal halla* or 'pot inspection' and proved popular.

Mention must be made of one Sudanese woman who became the senior staff midwife at the school, Sitt Batul Muhammed Isa. Sitt Batul came from an upper-class family and, unusually for an Arab woman, helped her father in his business. She married a feckless man who deserted her before their son was born. One day she attended the confinement of a friend, and was so impressed by the cleanliness and efficiency of the Omdurman-trained midwife conducting it that, in spite of strong family opposition, she wrote to Miss Wolff asking to be accepted as a trainee. After finishing her midwifery course she trained as a hospital nurse, but her heart was in midwifery and she returned to the school as a staff midwife. She had a gift for teaching, copying closely the methods and even the language (sometimes very forceful) of her teacher. No-one, it is said, could preach the gospel of anti-pharaonic circumcision as she could. A later matron of the school wrote, 'Sitt Batul Isa is quite the most remarkable Sudanese woman working in an official capacity today and will remain one of the outstanding women in the history of the Sudan'.²

Expansion

In 1932 much needed new buildings were completed. For the first time two trainees from the southern Sudan came for training - two members of the

Shilluk tribe of the Upper Nile Province. The delay in starting training in the South was due to several reasons. The great distances and almost universal illiteracy militated against an immediate start. In the three non-Islamic provinces circumcision was not practiced; childbirth, as a rule, was simpler and easier, and so the problem was not so urgent. Again there were 'wise women' amongst the many tribes. As soon as practicable, however, a start was made and in 1950 a Midwives' Training School was opened in Juba, Equatoria.

Retirement

The 'Wolves' both left the Sudan in 1937; few can have retired with such an achievement behind them. The standing of the school was assured, with a reputation second to none in the Middle East and North Africa, and, perhaps most important, it had gained the confidence and admiration of the Sudanese people.

In all, 304 midwives had been trained since 1921, and only 20 had their licences cancelled, some for carrying out pharaonic circumcisions. There were district midwives in all northern provinces and ante-natal clinics in most towns. In Omdurman and Khartoum only trained and licenced midwives were now allowed to practise. A firm basis had been established for the future building of a full midwifery service throughout the country. These pioneers were not forgotten by the Sudanese. Their retiral home in Sussex soon became the Mecca of visiting Sudanese midwives and doctors. Many of the midwives were old pupils taking special advanced courses in England. 'Our past frustrations and pinpricks,' wrote M.E., 'are certainly counter-balanced by all the blessings, love and appreciation of both Sudanese and others, and the kindness of hosts of friends - this, plus a God-given sense of humour and laughter, are good reasons for our present peace and happiness.'³ Both were awarded the MBE medal.

Recognition

In 1938 one of the assessors for the final examinations at the Kitchener School of Medicine, Mr J.S. Fairbairn, (President of the Royal College of Obstetrics and Gynaecology and Chairman of the Central Midwives Board) was asked to inspect the Midwives Training School and make an official report. 'Their school made me feel humble as a teacher', he said. He pointed out the need for expansion and the institution of a number of subsidiary training schools in the provinces, a larger cadre of more highly trained staff to carry out essential inspection work, and also for the work to be incorporated in a properly organised midwifery service for the whole Sudan. It recognised that expansion would, and should, be slow until more educated, literate pupils were forthcoming.

The suggestions of Mr Fairbairn were accepted and acted upon, and a programme of expansion agreed. Most encouraging was the increasing number of young Sudanese women of good class who were applying for training. Advanced training schemes were laid down to enable suitable pupils to be prepared to take over more responsible posts. Sudanisation was proceeding rapidly, in the field of maternity and child welfare where it was vital to have sufficient trained Sudanese staff to take over at the earliest opportunity.

In 1945 a Sudan Ministry of Health took over from the Sudan Medical Service, responsible for the coordination of all welfare clinics, the midwifery service, the training of midwives, nurses and health visitors, and the supervision of the Omdurman and the province midwifery training centres.

The government now felt that it would be opportune to take firmer stand against female circumcision, and the Governor-general asked for an authoritative review from the medical service. The result was a hard-hitting pamphlet describing in detail and exposing the cruelties and dangers of the pharaonic operation, written by senior Sudanese and British doctors. At the Governor-general's request the leading Islamic authorities in the Sudan added their views, and all of them declared against its continuance, and stated that its practice was contrary to the decrees of the Prophet himself. The pamphlet ended with these words: 'Circumcision is one of the major social problems of the Sudan. It is a legacy of the dark ages, which in a modern world is a social stigma, and it is the duty of the present generation to do away with it'. The following year, 1946, saw the enactment of a law making pharaonic circumcision illegal in the Sudan. Unfortunately it has not yet achieved its objective.

Sir Eardley Holland in 1946 wrote the last official report of the Midwives Training School as an independent entity. His concluding paragraph was much appreciated: 'The work of the school and the influences that spread from it was, I felt, more appealing than anything I know of in all medicine'.

Welfare

To cope with the advancing needs of a full welfare service embracing midwifery, it was agreed that four categories required training - district midwives, nurse midwives, staff midwives and health visitors. For the illiterate or semi-literate district midwives, the training course was lengthened to eight months to include tuition in infant welfare and hygiene, ante-natal clinics and home visiting with a health visitor. The district midwife was recognised as the backbone of the service, and large numbers were required to cover the whole country. To speed up their training, provincial centres were set up - El Obeid (1948), Juba (1950), Malakal (1952), Wad Medani (1953) and later at Atbara, Port Sudan and El Fasher. A staff midwife-teacher was in charge at each of

these centres, and when later a superintendent nursing officer was appointed to each province, the supervision of these training schools was included among her duties. A useful feature which grew up was the linking of the district midwife with the local dispensary, from which she could draw her supplies of drugs and dressings, and provide useful information on happenings in her area to the Assistant Medical Officer in charge. (Assistants were not qualified doctors but had specialised medical training.)

Nurse midwives were those who were fully trained nurses who wished to specialise in midwifery. On qualifying, the majority worked in government hospitals. Some elected to go on for further training and became staff midwives or even health visitors, the elite of the welfare services. Applicants for the posts of staff midwives and health visitors have to pass an examination requiring a high standard of general education and then appear before a selection board. The successful ones underwent eighteen months' to two years' advanced training.

A central Midwives Council comes under the direction of the Director of Medical Services, Ministry of Health. It coordinates all training schemes, standardises courses of instruction, and examinations for the Certificate of Midwifery, maintains a register of midwives and sets out the regulations and rules for all practicing midwives. The overall standards required are now on par with British ones.

A new administrative post, Controller of Midwives was created in 1954 and occupied by Miss E. Kendall, who was followed by a Sudanese, Sitt Hawa Mahomed. Miss P. Wright was the last British principal of the Omdurman School and in 1956 was followed by Sudanese principals. In 1955, Sitt Ali Bishir, the senior of the health visitors, was promoted Principal Matron (Hospital Service).

The position in 1955

1955 was the last full year of the Condominium government. Some 547 midwives had been trained since 1921, of whom 439 were practicing in the provinces; 26 of them in three southern provinces. There were seventeen nurse midwives in the hospitals, five staff midwives and 25 health visitors.

In Khartoum and Omdurman areas no untrained midwives now practiced. In rural areas there were not enough trained midwives to replace the old die-hards, but the latter were periodically inspected and the majority issued with 2nd class certificates. There were ante-natal clinics and child welfare centres in every province with expert control from headquarters. In Omdurman and Khartoum a qualified woman doctor was in charge of welfare services. The number of suitable applicants for any of these midwifery posts exceeded training capacity. Transport, for long a major problem, was partially solved by

the provision of 65 fully equipped mobile units and cars and ambulances and in addition there was a railway medical saloon and a hospital ship in the upper reaches of the Nile.

After independence

In 1967 evaluation of the Health Services in the Sudan by the World Health Organisation showed with what confidence and energy the Sudanese had accepted the challenge, and the prime importance that they had given to the full development of the midwifery and social services. This is best illustrated by the figures for 1965, ten years after independence. The number of district midwives rose from 547 to 1354, of nurse midwives to 227, a tenfold increase, of staff midwives to 41, and health visitors to 43.

Although female circumcision is far from being stamped out, there is an encouraging switch to the modified *Sunna* type of the operation and a slow swing of public opinion towards abolition.

The year 1971 was the 50th anniversary of the founding of the Omdurman Midwifery School, and in Khartoum there was a spontaneous celebration. Mabel Wolff had not been forgotten. She was presented by General Nimeiri, the President, with a special medal, the Order of Merit of the Democratic Republic of the Sudan.

Epilogue

Gertrude Wolff died in 1969. Mabel carried on alone with her memories and many friends till ill-health took its toll and she died in September 1981, aged 91 years.

Let their epitaph be the tribute paid to her in Henderson's Sudan Republic:⁴ 'A midwifery service inaugurated after the 1914-18 war by the Misses Wolff was probably appreciated more than any other activity in the whole history of the Condominium'.

Notes

1. The collection of 'Wolffiana' is placed in the Durham Sudan Archive.
2. Kendal, Eileen, *Sudan Notes and Records*, 31 January 1942.
3. Private letter.
4. Henderson, K.D.D., *Sudan Republic* (London, 1965) p.51.

APPENDIX

Equipment issued to each trained midwife

A galvanized tin box made locally and which can be sterilised by boiling and in which most of the articles can be packed:

1. Douch can (one pint) for douches and enemas
2. Rectal nozzle
3. Vaginal nozzle
4. Length of rubber tubing for hours 2 and 3
5. Small india-rubber, fiar-shaped syringe to give the baby an enema
6. Nail brush
7. Zinc box for soap
8. Two pieces soap
 - (i) carbolic for the mother
 - (ii) plain white soap for enemas and bathing baby
9. Teaspoon for measuring out Lysol
10. Small coffee spoon
11. Pair of cord scissors
12. Pair of artery forceps
13. Instrument tray (enamel) with cover to hold the scissors, forceps, silk-worm gut and cord threads
14. Two skin needles
 - (i) straight
 - (ii) half curved - kept in a small jar of Lysol ready for use
15. A razor
16. Catheter - gum elastic or soft rubber
17. Test tube for urine
18. Clinical thermometer
19. Small bag with silk-worm gut and cord thread
20. Tin box with sterile cord dressing
21. Tin dredger for starch cord powder
22. Bottle of saline lotion for baby's eyes
23. Drop bottle with Silver Nitrate 1 per cent eye lotion
24. Bottle of rectified spirit for flaming bowls when there is no time to sterilize by steaming
25. Bottle of Lysol
26. Bottle of Extract of Ergot
27. Bottle of castor oil
28. Jar of salt for saline enemas, etc. N.B. Every bottle cork is threaded with string which is tied round neck of bottle to prevent loss of cork

as corks are very scarce especially in rural areas

29. Box of matches
30. Macintosh sheet
31. Two overalls to be worn only during actual confinement
32. Three white uniform dresses made so they can be worn back to front as well as normally so that they wear out evenly
33. Three white native head veils
34. Three white aprons (only for midwives living in the more sophisticated districts) N.B. White is always worn except in the few areas where white is the mourning colour - then a fast coloured gingham is issued
35. Small teapot as an undine
36. Aluminium cooking pot with a specially locally-made zinc sieve fitted to allow cord dressings, cotton wool, etc., to be sterilized by steam and when the sieve is removed the pot is large enough to boil the douch in - the pot can be boiled over any type of fire (wood, charcoal, primus stove, etc.)
37. Calico 3bags - sets of three of each of five sizes (fifteen) to hold:
 - (i) Macintosh sheet and overall
 - (ii) Douch can
 - (iii) Vaginal nozzle and tubing
 - (iv) Sterile cotton wool
 - (v) Silk-worm gut and cord thread
38. Kettle or milk can to carry cold boiled water
39. Canvas saddle bag - for rural midwives for donkey, horse, camel or bull transport - one side holds the midwifery box, and in the other is the macintosh sheet, overall, kettle and can of cold water - the midwife rides on top.

THE CREATION AND DEVELOPMENT OF THE MODERN MEDICAL AND HEALTH SERVICES IN THE SUDAN

Dr Ali Bedri

The modern medical service was instituted in the Sudan some 80 years ago. Before that time medical attention was mainly based on spiritual rites and rituals, and also on locally produced drugs. All these have some significance in our modern medicine. Our psychiatrists are making use of the rites, at least to help them to arrive at a diagnosis of the condition and sometimes as an aid in treatment. Local drugs must have helped in the past to relieve symptoms, and are being studied now by pharmacologists.

Public health and sanitation were obviously unknown and consequently epidemics used to take their full toll on the population unchecked. There were no accurate records of such epidemics or their dates of incidence. Advantage was taken of a cholera epidemic that occurred in the late 1880s for assessing the ages of individuals and for recording dates of certain incidences before or after the year of the epidemic. In 1885 smallpox was known to have broken out in Omdurman resulting in the deaths of some 25,000 of its population. It was also known that smaller outbreaks occurred in 1881 and 1899.

In 1899, however, a military medical administration was established, mainly to look after the health of the troops, under Major Penton, the Principal Medical Officer of the Egyptian Army Medical Corps. In 1900 he described Omdurman as 'quite unfit for human habitation'.

The 1904 report ran as follows: Malarial fever is reported as having been exceedingly prevalent amongst the garrisons in Bahr el-Ghazal province. Egyptians are hopelessly unsuited to this country on account of this fever and the subsequent anaemia. The reason is not far to seek. Mosquitoes swarm over every square mile of the Bahr el-Ghazal province during the rains. No one who has not felt or seen them at Meshra El Rik can have any idea of their numbers.

The destruction of mosquitoes and their larvae, drainage operations and other measures were carried out at the various garrison stations such as Khartoum, Kassala and El Obeid, but no very striking improvements in the level of sickness were recorded.

In 1905 a small section of civil medical services was established with Dr Christopherson at its head. His main preoccupation was his fear that certain diseases might be introduced from adjoining countries into the Sudan, whose population was already fever-sticken and ravaged by smallpox: in particular bilharzia, ankylostoma and ophthalmia from Egypt; sleeping sickness from the Congo; cholera and plague from the east; leprosy from the west.

The public had no faith in a modern doctor. In one year it was reported that: 'The arrival of a medical officer in a village meant a general alarm. Everybody sought a hiding place.' A primary necessity, therefore, was to gain the confidence of the population. This was certainly more easily attained through the medium of curative medicine than insistence on hygienic measures. Once a doctor had gained the confidence of the people by relieving their ailments they were more inclined to listen to his advice on precautions needed to maintain health.

So in 1906 Christopherson advised that the northern Sudan should be divided into three medical regions each being provided with a well-equipped civil hospital. These hospitals were to be sited at Khartoum at the centre, Port Sudan in the east, and Atbara in the north. In 1909 the hospitals were complete, and he was appointed Director of Khartoum hospital. His policy was evidently successful and confidence grew. The authorities were apparently very happy when they recorded in the 1909 report 120,000 outpatient attendances and that 40,000 people had been vaccinated.

I have a little story here. I was vaccinated in the year 1909 and I must have been included in this figure of 40,000. My mother was reluctant to have me vaccinated, but I was seized and the Sanitary Barber vaccinated me. My mother, being defeated at first, succeeded later when she rubbed my vaccinated arm and I was saved the aches and pains of a successful vaccination which occurred to my other schoolmates. When we were sent to the Gordon College in Khartoum in 1914 we were again vaccinated - no mothers to rub it off our arms and I had a terrible reaction, it being my first successful vaccination.

Important research work was initiated under the great research officer-doctor, later Sir Andrew Balfour. At that period they were mainly concentrating on malaria and its mosquito, sleeping sickness and on what was called the mysterious disease of *kala-azar*. By 1913 the records show 20,891 outpatients and 9778 in-patients, while the total number of vaccinations went up to 70,620. Major Bray, the then Principal Medical Officer, reported that 'the appreciation of the medical work is shown by the increased number of hospital returns.'

In the year following the outbreak of World War I the smooth progress of the medical services was checked. However, one important development was allowed to proceed - the creation of an independent Civil Medical Department for which a Civil Director was appointed for the first time, Dr Crispin. Another outstanding feature of that period was the discovery by Dr Christopherson of the treatment of bilharzia by antimony salts. A Midwives Training School was opened in Omdurman in January 1921 (see Cruickshank's paper above).

By 1921 it was reported that 'the mistrust with which the Government hospitals were regarded in many places shortly after the re-occupation has given way to complete confidence in the beneficent activities.' The services had then

started to give more attention to preventative medicine and on the basis of curative medicine began to erect public health services. More sanitary inspectors were appointed from the UK and they began to find that their advice on hygienic measures was well regarded and the authorities' insistence on sanitary regulations greeted with cooperation.

To compensate for the lack of doctors and to extend treatment in rural areas, the authorities formed a medical assistant cadre. In 1923 the era of the Medical Assistant with his dispensary began. The elementary course in medicine and surgery for old male hospital nurses was initiated and established and conducted by Dr Hodson when he was Director of the Khartoum Hospital. The scheme was widened and the curriculum expanded. Medical Assistants still serve a very useful purpose.

The authorities, recognising that the success of any medical services would necessarily depend upon the formation of a medical manpower from among the people of the country itself, and seeing the success of the training centres for midwives and medical assistants, established other training centres for most of the auxiliary medical services. A School of Nursing, a centre for training Assistant Dispensers and Assistant Radiographers were established. In 1924, however, the bold venture to establish a School of Medicine in Khartoum was made possible in a country where there was only one secondary school. I shall talk more of this Medical School later.

Dr Atkey, the then Director of Medical Services, emphasised in his 1924 report the value of medical and sanitary work in connection with economic development. He defined the objectives briefly as keeping the existing population healthy and fit for work, and ensuring a steady increase of population to provide for future development. To ensure the first objective it was necessary to guard against outbreaks of smallpox, epidemics of cerebro-spinal meningitis and, in particular, malaria, which diseases when they become epidemic have a decimating effect on the population; also to combat certain endemic diseases such as bilharzia, ankylostoma and the dysenteries which sap the vitality of the population, lower its powers of resistance and diminish the birth-rate. To ensure population increase it was necessary in particular to deal with malaria and the venereal diseases, both of which greatly diminish the birth-rate.

The medical authorities at that time must have been preoccupied by the forthcoming Gezira irrigation scheme. They were particularly worried about the introduction of bilharzia into the irrigated area through imported labour. The scheme would require *saidi* labour from Egypt to canalise it, people from the Northern Province to help in farming it, and West African labour to *hish* the land, pick the cotton and gin it. Anti-bilharzia campaigns were established in various areas inside the Sudan from where labour or tenants for the scheme might be drafted. Quarantine measures were reinforced at Wadi Halfa. The

scheme benefited from Dr Atkey's original first objective. As regards his second objective, venereal diseases and other endemic diseases were fought through the medium of a network of dispensaries scattered throughout the country. Efforts were made to attract the people to seek treatment in them.

When my colleagues and I joined the Sudan Medical Service in 1928 having been the first batch to graduate from the Kitchener School of Medicine in Khartoum, we found the order of the day was that promotion of medical staff depended on the increase of attendances of outpatients and hospital in-patients. So everyone concerned set out to attract patients to their various institutions.

By 1933 Dr Pridie, later Sir Eric Pridie, took office as Director of Medical Services. This was the period of vigorous expansion of curative medical institutions, when the seeds for more advanced preventative medicine were sown. People rushed into hospitals and dispensaries and their confidence in modern medicine was fairly well secured. At this stage the authorities wisely marked time over expansion in curative medicine and proceeded further with preventative measures. A separate branch of public health was established in 1935 when a second post of Assistant Director in charge of public health services was created, leaving the original assistant director to be in charge of curative medicine only.

By 1937 the number of Sudanese doctors was 60, all graduates of the Kitchener School of Medicine. From that year the Sudanisation of the senior medical posts started with the object of getting them to shoulder the responsibilities of the whole service in the near future, thus realising the objectives for which the school was established. As early as 1934 the chairman of the school Council had said in his annual report that the object of the school was to create a body of Sudanese doctors to man in time all the posts in the Sudan medical service. Sudanisation in the medical service thus began in advance of any other service in the country, and continued to lead the way. In 1948, a Ministry of Health was created and assumed responsibility for the planning and the organisation of medical and health work. The Sudanese who followed decided that their medical services had been founded on correct lines and that the traditions of the past were maintained, and so it went on.

By 1949 we had passed the period when the 'order of the day of 1928' was to attract more patients, and entered the period of demand for more medical institutions. In 1907 there had been 94,000 recorded outpatient attendances for the whole country; the record in 1949 was over ten million, and instead of dealing with a population of about three million in 1904, the population in 1949 was eight million. These developments necessitated in 1951 the working out of a ten year health plan which aimed at the expansion and consolidation of the health services. The then Minister of Health stated in a public speech, 'I should only like to hope that financial conditions, medical manpower and building potentialities be as such as would enable us to carry it out.' He continued: 'If

this happy result is achieved I am confident that the plan will lead to the promotion and preservation of health and consequently the happiness to the greatest numbers of the people of the country.' But the movement of life runs and gives rise to tremendous changes of attitudes in the human outlook. The health services in the Sudan require more!! and the struggle continues!!

The Kitchener School of Medicine, Khartoum

Reports say that when Lord Kitchener visited the Sudan in 1911 at a time when the Gezira irrigation scheme was proposed, he remarked that there should be a strong health force to combat the foreseeable wide range of diseases, and that such a force should be from the indigenous population. The school was projected for the commemoration of Lord Kitchener after his death in 1916.

The institution of the school was obviously ahead of any expectations. The only possible source from which candidates could be drawn was the unique Gordon Memorial College with a total number of 30 pupils in their final year. This is a very shallow source from which to draw for starting university education.

There was a lot of discussion as to what level of medical education should be given by the school. Dr Atkey who was the first chairman of the school Council insisted that it should be a school with a full medical course suitable for the health needs of the country. We are grateful to him. He succeeded and the Kitchener School of Medicine was established in Khartoum. The first ten boys, of whom I was one, were admitted and the school opened on 29 February 1924.

We were quite unqualified for the course. We knew nothing about Chemistry and we only heard about it and Physics at that school for the first time. We were greatly disappointed when our teacher, Dr Joseph, after our first term examination notified the results: 'Only one student has 50 per cent. The others practically no percentage.'

The whole cadre of teachers were drawn from the staff of the Wellcome Research Laboratories and from the doctors serving in the Sudan medical services. But both teachers and students replaced their disappointment from the poor results of the first term with hope and augmented their efforts, and the school went on.

The curricula were based on practical vocational lines to equip the prospective Sudanese doctor to cope with whatever material came to hospital for treatment when he alone was in charge of hospitals in out-stations. The whole course of training for a student was to be compressed into four years. I remember that on our first day in the school Dr Hodson asked us, 'How long

are you going to spend in learning medicine?' Our answer was 'Four years'. His comment was, 'You will continue to go on learning medicine up to the end of your lives.' He was right.

From the start the school Council decided to invite external assessors to attend final examinations, to report on the progress of the school, and to advise for the future. The first were British professors from the Kasr El Aini School of Medicine in Cairo. Their reports were always favourable. The good school results were partly due to the small classes of ten students at a time, enabling each student to receive personal attention from the enthusiastic teachers who were government officials paid by the central government. The school paid them only a small subsistence allowance. One of the earlier assessors ended his report by saying: 'This institution is probably the cheapest (consistent with efficiency) School of Medicine in the world.'

In December 1927 the assessors reported that all the seven students in the first batch to graduate were equal in standard to those who were qualified in the Kasr El Aini Medical School in Cairo and the American University of Beirut. They added that a few of them might be equal to the pass of the Conjoint Board in London. But I remember the comment of the assessor in surgery on a leg amputation I carried out on a cadaver: 'Is this a surgical operation or a camel bite?' He was obviously affected by his surroundings in a desert country and also by my thin tall body and long neck. He might have thought me to be a camel! However, I was passed with the other six boys as qualified and we were granted the school Diploma in Medicine for the first time in the Sudan.

We were thrown into the wide sea of practical life and left to struggle to prove that we were real doctors, acceptable as such to our Syrian colleagues and to our own people. The struggle was very hard indeed. Every step we took was a novelty with no indigenous persons to act as examples. You yourself set the example for the others to follow; you had to be a pioneer, whether you liked it or not.

In my first year as a house surgeon I was to be trained in giving anaesthesia to patients. On entering the theatre on an operation day I found a Syrian doctor giving the anaesthetic in my place. I was shocked when the senior surgeon shouted at me: 'Go out, I don't want you'. A shocking affair, especially when it came so soon after the camel bite episode. I knew later the dismissal was on account of my being three minutes late: a lesson in punctuality! These were useful lessons, learnt through very harsh dealings.

I was in charge of Dongola hospital all by myself in 1929, when Dr Atkey was to visit the hospital. I spent the few days before his arrival in tidying up. I made sure that everything was in order. On leaving the hospital at night I looked back at it and noted the flag was ragged. I had it changed and again looked back to see that the outside surroundings of the hospital were clean too. I went to sleep happily. I had a dream and in it I saw the seat of a latrine was soiled. My

first duty in the morning was to see that the latrines were further tidied up. On taking the Director around the hospital I kept him away from the doubtful latrines but he changed the route and went back to inspect the latrines. He found them filthily soiled in a fashion exactly similar to what I saw in my dream! He commented: 'Most unsatisfactory'. All my efforts of a week's hard work were dashed, but a lesson was learnt - you cannot be too meticulous.

Our own people, who had only recently been convinced to make use of the alien medicine introduced and practised by alien doctors, were in great doubt whether the alien medicine could be practised by a Sudanese, and even had difficulty in believing that the Sudanese doctor was a doctor at all. It took a lot of hard work and patience on our side to gain their confidence and enable us to serve them. In 1933, a cook serving with a British captain in the garrison in Khartoum was medically certified by me as drunk and therefore put in custody overnight by the police. When questioned by his employer he answered that the certificate was a fake and that he was never seen by the doctor. I was asked why I signed a report without seeing the patient. The cook was questioned by the head nurse who remembered him and asked, 'Why did you say you were not seen by the Doctor,' pointing at me. The honest cook retorted, 'But is this a doctor?' Alas, I gasped in despair.

However, the Sudanese doctor was eventually recognised not only by his own people in the Sudan, but also abroad. The Royal Colleges in the UK recognised the Kitchener School of Medicine Diploma as early as 1946. Several Sudanese doctors were admitted for courses in various teaching hospitals in the UK and they obtained the various diplomas, thanks to those who taught them in Khartoum and to the then chairman of the school Council, the late Sir Eric Pridie. Ever since, Sudan medicine has been closely connected with British medicine, to the benefit of the Sudan. The first qualified British professors were appointed to the school in 1952.¹

Now all professional posts and teaching duties for both under- and post-graduate courses, and the research work are carried out by the graduates of the Faculty of Medicine, University of Khartoum.

Note

1. See paper given at Durham Sudan Conference 1982 by Dr H.V. Morgan, '1962-1967 in the Medical School'. This paper is lodged in the Durham Sudan Archive.

IN DISCUSSION: MEDICAL SERVICES

(Chairman: Dr John Bloss)

Dr Cruickshank: We started off with a certain number of advantages. ... We had Kitchener's advice to start training the native staff and the Sudanese doctors because in a big country like the Sudan it was the only possible way of getting direct to people. So we got in first and we creamed off the best of the Gordon College students. The most important advantage was that the first fifty years of the Condominium coincided with the greatest advances in tropical medicine we have ever seen. For the dreadful disease of *kala-azar* ('father of the axe') or CSM disease we were the first to use Prontozone in the field, with miraculous results. We got the first supplies sent down by air and collected them by lorry and there were enough we presumed for 20 cases. We chose the first 20 cases very carefully. The results were unbelievable. In getting control of the epidemic diseases which hit the Sudan, we got the confidence of the people which helped the administration to advance. A very good example of that was the relapsing fever epidemic in Darfur in 1926 which had already killed 6000 people in one district and was spreading rapidly eastwards threatening the Gezira scheme. There was doubt as to whether the disease was carried by lice or ticks, and in order to find out Dr Riding was sent out from the tropical laboratories with 50 white rats. He put these on the running board of his Ford car and before he reached his destination 49 of the rats had died of asphyxiation. During his trek, his cook developed relapsing fever so he took some blood and injected it into the rat. He went to the District Commissioner's house and the first thing that happened was that the rat disappeared down a hole and was never found again! But he wasn't defeated; he put the test-tube under his arm and finally found that the spirochete was carried by lice. Dr Atkey mobilised every possible reserve and paramedic to attack the epidemic by starting delousing stations between Darfur and Kordofan, and we were very successful.

Peter Abbott (1942-1955): When I first went to the Sudan I found the Sudan Medical Service held in the highest esteem because of the extraordinarily high calibre of the Sudan medical officers. They served not only their own people well but also the expatriates.

Drugs were in very short supply and to make them go round in the dreadful epidemic of CSM among the Midobes and others we ground up two tablets, talc, chalk and all, and injected them into the buttock - a very painful procedure for the patient but it worked. Whereas those who had no treatment had an 80 per cent chance of being dead at the end of a week, those who did have these magical tablets had 80 or even 90 per cent chance of being alive. I remember going round on camels with the ADC from village to village, injecting these

cases of CSM and eating the fatted calf in the evening. It was really most exciting for a young doctor and very rewarding in every respect. There may have been complaints when we handed over the Sudan Medical Service at self-government that it was a rather simple and unsophisticated service. We had no complicated radio-therapy units or cardio-thoracic units. We didn't even have a mental hospital in Khartoum and as far as I know there was hardly an electro-cardiogram there. But I suggest that our very able directors of medical services had got the mix right. That indefatigable trekker Eric Pridie said to me, 'You must remember that more lives will be saved in this country by a few grains of quinine, in the right place, at the right time, than by all your sophisticated medicine, and so you must get your priorities right.' He told me, 'You are called a medical inspector and your job is to make sure that the few grains of quinine are in the right place, at the right time.' And I took that advice. His view was, 'The medical assistants in the Sudan will save many more lives than the doctors', and so they did. They were quite invaluable also in epidemic control: we knew from the dispensaries when trouble was brewing and we could then act.

David Lewis (1935-1955): I was entomologist in the Medical Service. The Sudan made numerous contributions to medical entomology - the study of the insect factors of disease. The initial encouragement by Sir Harry Wellcome created a great tradition of research in the Sudan. I have been to a number of countries without such a tradition and it emphasised the great value in the Sudan. Another factor was the enormous size of the Sudan which meant there were numerous insect-borne diseases - malaria, yellow fever, *kala-azar*, sleeping sickness, river blindness in the southern Sudan caused by a little midge-like fly, and the great problems posed by the huge reservoirs, and also other difficulties caused by the green nimitti of Khartoum and the terrible pest of the black nimitti of Dongola. Another important factor in all this research was that so many people were available to do it. I used to read the province diaries with great interest: they had so much information about animals and plants and insects and natural history generally which produced the invaluable background of knowledge. Also the facilities were very good, for instance the government built the Gezira Research Farm and its splendid library and collections. Another factor was the very ready cooperation of the Sudanese people. One example was in 1940 when Professor Robert Kirk was in the Nuba Mountains, investigating a very serious epidemic with a lot of deaths and nobody knew what the cause of it was. One day Robert Kirk saw a procession of rather fierce looking Nubas carrying a dead body at a burial. They didn't look very cooperative, but in fact they stopped the procession put the body on the ground and let Robert remove a sample of liver which was sent to Khartoum and was very useful in diagnosing the disease as yellow fever. An important aspect of research is the communication of results to other countries and the ease of data

retrieval. A very important tool for this purpose is the Tropical Diseases Bulletin, which had its origins in the bulletins issued by Sir Andrew Balfour in the early days after Wellcome had started the laboratories.

Meccawi Sulaiman Akkrat: In 1938 when I first came to England, I heard from Sir Reginald Wingate how it was that the Sudan got hold of the Wellcome research laboratory. He said Henry Wellcome was staying with him at the Palace and had with him a lady. One afternoon he came and said, 'You must congratulate me,' and Wingate replied, 'If you promise to do something for the Sudan I will congratulate you.' Sir Henry said, 'Yes, I will do that: the lady whom I wanted to marry me has accepted my offer.' And so Sir Reginald congratulated him and said, 'You must supply the Sudan with a tropical laboratory.'

Dr Hugh Morgan: The students of the new University College of Khartoum were most teachable. On my first ward round we went to a bedside. At that time I had not learned any Arabic, so I asked the students, 'How do I say to this man, how are you?' And they as one voice said, *Ma'a al-Salama* (goodbye). So I walked up to the patient and said, shaking him by the hand, *Ma'a al-Salama*, and he fainted! And I said to myself, these are the sort of students who will make good doctors. The number was small and so we got to know them extremely well. That first generation are now coming to the head of their profession, having had a postgraduate training, experience in many countries, attended many conferences and have contributed much to medical knowledge. The Sudan is now largely self-sufficient in medical expertise. We recruited very strongly both professors and senior lecturers. The staff were not on any pensionable scheme; it was a five-term contract which worked well because people could stay for two or three years and then go and we could recruit other short-term staff to fill the gaps. I should like particularly to mention George Daly, who really created good gynaecological procedures and made a very big impact in helping the ladies in this country. There was at that time no recognised medical qualification in that field. Professor Daly, as well as organising and teaching, did the one thing which was within his power - he created a diploma in obstetrics and gynaecology. This was the one way we could get people to England with enough experience to be classified as a true gynaecologist.

Mohammed Omer Beshir: Dr Daly's postgraduate diploma in 1958 was the first postgraduate award in the University of Khartoum, and its success encouraged postgraduate work of all kinds.

Alleyne Nicholson (1923-1949): It seems to have been assumed, particularly in the early days, that members of the government service could help with medical problems. When I was in the Renk district there were odd cases of people who died from unexplained illnesses. Where the District Commissioner's liability came in was if that chap died it was always assumed it was caused by witchcraft and before you knew where you were you had a

murder case on your hands. It was important to explain that some of these diseases were understood and could be treated, e.g. *kala-azar*. When I was in Nagishot in 1926 I got quite expert in extracting guineaworm from the leg.

Morris Lush: Just for the record let us pay tribute to that wonderful band of Syrian doctors who bridged the gap so well before our Sudan medical officers came in.

Part IV:
EDUCATION

THE REFORM OF THE SUDAN'S PRIMARY EDUCATION: SOME HISTORICAL PERSPECTIVES

Robin A. Hodgkin

The story of how Bakht er Ruda was founded in 1933 - out in the blue, on a shoe string budget in the teeth of a recession - and of how primary teacher training and the primary curriculum were imaginatively reformed, has all been well told by V.L. Griffiths in his book *Teacher centred*.¹ One additional negative factor which he does not stress should perhaps be emphasised. It is brought out in the second volume of Sheikh Babikr Bedri's memoirs and especially in the introduction by Professor G.N. Sanderson.² The latter draws a sharp contrast between the educational freshness and enterprise of the first fifteen years of the Condominium and the ice age of the 1920s, the age of Lugardian dogma and 'native administration'. Bakht er Ruda grew against that background too. If one could see all these things more in the dimension of eternity, it is possible that the policy of refurbishing the Koranic schools (*khalwas*) rather than starting again and building a modern curriculum in the 1920s might be justified. There was something to be said for their simplicity. Seen through the eyes of highly educated, westernised Sudanese in the time of transition towards independence, it must have appeared as a totally retrograde policy.

Three other historical or socio-cultural patterns will form the bulk of my paper. They are, firstly, what may be called the confluent streams - where did the stimulating ideas, the appropriate novelties, come from and what did they encounter? Secondly, what was the nature of the cultural mixing process and what were its limits? Thirdly, what went wrong and what went right; what are the positive lessons for similarly placed developing countries now?

The confluent streams

There is no doubt that the wisdom and integrity which many Sudanese brought to Bakht er Ruda had their roots in the Muslim faith itself. One gets an authentic and moving sense of these influences in Babikr Bedri's memories of his own schooling in the 1870s: 200 children taught by one holy man on the banks of Blue Nile. True, the Fekki had a long whip, yet he also had, much more important, a kind of holiness (or charisma) and a certain narrow scholarship.³ In his recent writings on Islam, Ernest Gellner has given a persuasive account of Muslim society and suggests that it can be understood in terms of its dual

origins and development: in pastoralism *and* in the world of early literacy.⁴ What he leaves out, however, is the dynamic power of Islam, its capacity to sway and change masses of ordinary people.

I have not the knowledge or insight to analyse further the great cultural stream of Arab civilization which we Westerners encountered at Bakht er Ruda. Our vision was, in any case, extremely short-sighted. But why was it that intelligent and patriotic Sudanese were ready to work wholeheartedly with the imperialists on such tender projects as educational reform? And, secondly, what was the essential nature of the interaction process: how did it happen? The 'how' question will concern us later. The 'why' question has, I think, a fairly simple answer.

In the 1930s there were a few Sudanese who came to share an important vision with a few English educators. This was a tacit belief in eventual Sudanese independence. Because this belief was rarely made explicit, this underlying confidence about a central issue created a good context for action. People like Scott and Griffiths would not declare such a belief and yet it would come out in practical discussions. 'Why are these school boy business meetings important, why shouldn't the teacher just decide?' 'But aren't we trying,' the reply would come, 'to teach them to be capable, in the future, of running their own affairs?' I have no doubt at all that it was the resulting limited area of long-term trust which made sustained high-level cooperation possible - the confluence of two great rivers. One saw it in other fields, in people like Arthur Gaitskell and Douglas Newbold. What is important is not what you say, but the message and meaning which you generate by all that you do.

Because I understand the alien, inflowing stream of ideas better than the indigenous one, I shall go into it in slightly more detail. Even so, there are important matters which are not clear. Why, in the mid-1930s, was there an incipient ambience for change? Why did 'they' bring in Christopher Cox? Why are the members of the Political Service beginning to take themselves less seriously? Why was the policy of 'native administration' dropped relatively suddenly? These are problems for wider discussion. Given that initial thaw, however, one can trace the sources of the radicalism that began to penetrate education, not only at the primary level but all through. Where did this radicalism come from?

The question can be approached in a quasi-biographical manner by asking what were the intellectual and philosophical springs of the most creative educational people, such as G. C. Scott and V. L. Griffiths? Our British universities had something to do with it. Many of the key people had, as it happens, a foothold in Oxford. Equally strong or stronger was the influence of London, especially the old London Day Training College and subsequently the London Institute of Education. Names such as James Fairgrieve, Percy Nunn, Margaret Wrong, Margery Perham and - later - Lillian Penson spring to mind.

Again, the Christian church had an effect, more diluted but more pervasive. The influence was compounded of memories, feelings and ethical codes, touched with the nostalgia, cynicism and sadness of the early 1920s. There was stoic disillusionment too.

Scott was a great Housman fan. Like Griffiths, he loved the spires and the music but rarely went to worship. The Christianity of Khartoum was not sufficiently radical. It sustained many, amused many and its ethical code was both strong and infectious. Then there was India. Its influence came very perceptibly through Griffiths who had worked there and had stayed in a Gandhian *ashram*. The inspiration of India's non-violent struggle was pervasive. I still have a ragged copy of Nehru's *Autobiography* which was borrowed and read by many of the Sudan's first university students. There was a resilient philosophical strand too: what may be called 'Dewey-type pragmatism' or 'learning by doing that which *can* be done.' This is still a very sound working educator's philosophy, one which only begins to show its weaknesses when it has to deal with conflict, with the sources of value or with religious education.

There were many other factors at work too: negative ones such as our own low level of attainment in Arabic, our uncritical attitude towards academic qualifications, examinations and IQ tests. There were wider positive emanations in the air of the 1930s too. There were signals from Spain, signals from the New Deal and then the cataclysm of World War II. The war may have dammed the flow of change for a while, but it is remarkable how many pent-up forces for change were released as the storm passed.

The mixing process

It is relatively easy to list such elements contributing to change, but more difficult to understand the dynamics - the dialectics - of the process. The model which I use - limited patches or islands of cognitive common ground being created out of a flux of feeling, shared experience and tension - is not orthodox sociology, but it has respectable antecedents.⁵ (See diagram in Appendix to this paper, p.165).

The first condition for effective interaction across a cultural divide, then, is some shared, but largely tacit, understanding of a long-term purpose. There are two other elements in such a process. They will be evident in many non-educational encounters but in curriculum development, where the content of education is under energetic review, they become unusually visible. The first essential is that those involved in the process must exchange information mainly at the level of common action and common experience, whereas verbalisation and theory must be largely retrospective. Note, however, that this precept does not apply to strictly technical cooperation, as for example the building of a

bridge. Here the cultural conflict is kept out of the arena. In education you cannot do this. The second precept is the corresponding negative one, that you must not be in a hurry to formulate many conceptual matters at the beginning - rules or principles, for example. Indeed you will probably have to discover means of hedging or leaving open or earthing some of the more powerful sources of conflict. Agreeing on *problems*, which are of their essence open, is perhaps one of the most helpful early procedures. You almost have to learn to love problems. In educational experimentation the crucial words are 'let us do' or 'let us try ...' The knowledge which results from such experiment may be in part capable of assimilation to a useful theory, but a great deal of the resulting knowledge will be at the level of feeling, humour, intuition - all of which are powerful but inarticulate.

Bakht er Ruda may have started as a dubious *merissas* shop on the road to Ed Dueim: it became something between a research station and an *ashram*. What you would see in the late 1940s was a few dozen houses, mud huts and low brick buildings cracking on the cotton soil, shimmering in the haze. In the early post-war days there would have been between 50 and 60 teachers (perhaps five British and the rest Sudanese), about 150 student teachers and 600 or 700 school children. Breakfast with the Principal became an informal institution, an English-speaking occasion when a lot of work was done. Similarly at Sudanese meals and coffee sessions work as well as families and politics would be discussed in Arabic. In the middle ground - in the zone of active cultural overlap - problems of work and policy, of planning and evaluation were constantly talked over jointly. In the diagram I have analysed the wider social pattern which emerged and have indicated with stars those occasions where curricular ideas and plans were mainly hammered out. Several points should be stressed about this diagram:

1. Cross-cultural understanding and the emergence of viable new ideas happen mainly in 'the overlap' - where joint action was natural - and this was particularly the case with curriculum experiments.
2. For this joint action to occur without undue strain it was also necessary that there should be plenty of discussions in the *separate* cultural groups; hence those breakfast talks. This allowed for monitoring, for second thoughts, for letting off steam about your 'opponents' and for more uninhibited exploration of possibilities than would have been possible in a mixed group.
3. Notice how most of the single cultural functions are recuperative and recreational. But I remember some interesting exceptions. Whist

was played in the Sudanese club; bridge was played jointly. Occasional serious argument on philosophy or politics would also form a kind of joint recreation.

4. The importance of the overlap in non-intellectual activities must also be stressed. These might be in the form of ritualised entertainment - for example, the anniversary festival for everybody (the Ruda 'Id) or the large tea parties for visiting courses. Other activities might involve shared inconveniences, arduous journeys, sailing expeditions, joint inspection tours, or just the hardships of malaria, of no fans and a distance from the big city. They were all shared. Humour played a vital part here too. 'Play' is a kind of wordless cement - not brittle: more like cow-dung than concrete.⁶ There is also indicated in the diagram a certain 'underground' element of play and interaction. On one or two occasions this erupted in slightly unsavoury outbursts of antagonism to what was seen as conventional wisdom or propriety.
5. Finally the arts should be mentioned, especially the visual arts. From an early stage there were artists at Bakht er Ruda, many Sudanese and a few British. Their influence was of great importance through the exploitation of non-verbal media in education and entertainment.

What are the lessons of Bakht er Ruda?

After independence came tremendous expansion and consequent dilution of teacher quality and teacher support. The political pressures for vastly more schooling were irresistible. Many have commented on this. Griffiths's own retrospect is of particular value. He is writing about the early 1970s:⁷

The simpler kinds of learning appear to have become established in many of the Primary Schools of the Sudan, but the more difficult kinds of learning - planning, judging relevances, self-checking, thinking ahead - have mostly not.

All over Africa a similar surge of numbers and a dilution of teaching quality happened as a result of independence. It may be, however, that a more general counter-current is just starting. Even the World Bank is beginning to wake up and to publish - on very shiny paper - new shibboleths about grass roots change and small being beautiful. An outstanding book which focuses on these problems is Hugh Hawes's *Curriculum and reality in African primary schools*, which assesses the question with authority and clarity.⁸ Hawes writes very

much in the pragmatic and realistic vein which one associates with Griffiths. It is possible to pick out from his extensive survey and recommendations eight main points which highlight the earlier lessons of primary reform in the Sudan. Four of these we did put into practice and they now need, in various ways, to be rediscovered. Four of them we did not make central to our educational reforms. The reasons for this were partly historical, partly that we just did not see the problem as urgent.

Things which Bakht er Ruda pioneered and which are still relevant

1. The idea that the training of primary (and intermediate) teachers, the reform of the curriculum and the production of essential teacher and learner materials should be done, to a considerable extent, by the same teams of people at the same centres.
2. The idea that curriculum reform must be understood as a pragmatic, continuously rolling programme which maximises feed-back and in which objectives as well as progress can frequently be re-evaluated. Included in this should be the vital tactic of ensuring some early popular successes which will encourage less resistant public attitudes.
3. In the Sudan we evolved a system which we termed 'technical inspection'. It was done by teacher trainers and curriculum workers and its purpose was to gain intelligence and to offer support to newly trained teachers. This was complementary to, but quite independent of, provincial administrative inspection, so tact was needed.
4. The importance which we gave in the Sudan to in-service training is echoed throughout Hawes's writings on Africa. For rich or poor countries it is the most effective form of teacher education.

What we did not fully realise ...

1. There is often a tremendous educational loss because methods and materials for teaching, and rates of pupil progress, tend to be geared to the abilities of the top ten per cent or so; they are the ones who suffer from no disadvantage of innate ability, of physique, dialect or class. Much more emphasis in teacher training and in

curriculum design should be given to keeping open several routes to success. On the other hand it must not lead to a structureless, untestable mish-mash.

2. Hawes stresses the need to rethink totally the concept of primary education so that it becomes more local, more complete in itself and yet maintains its proper civic and national function. He calls the new concept 'basic education'. It is not a new term, for it has roots in the Gandhian tradition and elsewhere. In Bakht er Ruda, though we were inevitably and heavily biased by our 'elite-generating' assumptions, these other ideas were around. But they easily became smothered. The following are some of the principles on which a new 'basic education' might be built:
 - (i) that different paths to success must be planned;
 - (ii) that individual and local achievements must be given priority over external achievements, such as public exams;
 - (iii) that more local curriculum material must be used and that this will involve using local craft and farming skill wherever possible;
 - (iv) but not in the impossible sense of making the primary school self-supporting;
 - (v) an increasing partnership with the community in sharing school plant and in discussing educational problems; there is also a strong case for the much greater use of lightly trained auxiliary teachers in basic education.
3. Such reforms can be brought about by reducing the backwash effect of external selective examinations. ('Sir, we can't waste time studying local trees because they won't figure in the exam'.) This is just one manifestation of the diploma disease - a world-wide scourge which, by degrees, we have got to cure.
4. There are certain universal skills for living competences, I think they should be called - which ought to be taught right across the curriculum, not just as one subject. These are: basic competence in language(s); in numeracy; in visual and graphic skills; in music; in physical and manual skills; and in interpersonal competence - the groundwork of moral and social behaviour. These are all more fundamental than any narrow subject. Indeed, any subject properly taught requires most, if not all, of these for its groundwork: they should be seen as more fundamental than any subject division in the curriculum.

This last point is more of a long-term good than some of the others. Long ago at Bakht er Ruda we were edging that way. The next big revolution in education will be to do with rediscovering wholeness - and holiness - in education. Jean Pierre Greenlaw helped Ismail Mohammed el Amin to value music and art; Ismail sang to us as we sailed back through the reedy shoals of Shebbasha. We printed the songs on the back of *El Sibbiyan* magazine for other kids to sing. The sun goes down over Jebel Arashkol. The notes of the *Dobai* float over the waters of memory and one can't help wondering, not for the first time, just who was educating whom?

Notes

1. Griffiths, V.L., *Teacher centred: quality in Sudan primary education 1930-1940* (London, 1975). This was based on an earlier survey, *An experiment in education* (London, 1953). The former book has an important retrospective evaluation.
2. *The Memoirs of Babikr Bedri*, Vol II (London, 1980).
3. *Ibid.*, Vol. I (1969), pp. 4-5.
4. Gellner, E., *Muslim Society* (Cambridge, 1981) and *The Times Higher Education Supplement*, 20 November 1981.
5. See the anthropological writings of Edward Evans Pritchard and, even more, of his contemporary Gregory Bateson. Bateson's distinction between the shared cognitive system of a human group (its *eidōs*) and the groundswell of action, ritualised feeling and tension, the (ethos) from which *eidōs* arises, is very apt. Bateson, G., *Naven* (Stanford University Press, 1958 [1936]) and *Steps to an ecology of mind* (Granada, St. Albans, 1973).
6. See Hodgkin, R.A., *Born curious* (London, 1976) Chapter 6.
7. *Op. cit.* p. 118.
8. London, 1979.

Appendix: the Sudan Institute of Education, early 1950s

Degree of cross-cultural overlap at Bakht Er Ruda by staff involved in teacher training and curriculum development

BRITISH ONLY	MAIN OVERLAP	SUDANESE ONLY
ENGLISH LANG.		ARABIC LANG.
<hr/>		
Breakfast	Fortnightly meetings	Principal & Vice Princ.
Informal shop talk	(Heds of Section)	Breakfast & supper
	Curriculum work	Meeting at Club
Evening drinks	Experimental &	Coffee & shop talk
Classical music	demonstration lessons	Radio: music & politics
	Formal tea parties	
Occ. Christian	Inspection tours	Fri. Mosque
service (not all)	Swimming pool	(most not all)
	'Expeditions'	
Women visiting	Women visiting	Women visiting
	Bridge	Infant welfare session
Tennis	Anniv. festival	Whist
	Drama, games	
Christmas party	Co-op bakery	Religious festival
	'Underground'	
	Booze-up & poison pen	Political pressures
		Student Union
		Peace Movement

HIGHER EDUCATION UNDER THE CONDOMINIUM

A. B. Theobald and W.M. Farquharson-Lang

(Sayed Nasr al-Haj 'Ali, ex-Director of Education in the Sudan and the first Sudanese Vice-Chancellor of the University of Khartoum, was prevented by illness from writing this paper.)

Gordon Memorial College

A. B. Theobald

After his victory at the battle of Omdurman (or more correctly, the battle of Karari) in September 1898, Lord Kitchener issued an appeal in November in Britain for £100,000 to build a college in memory of General Gordon. This was to be the centre of higher education in the Sudan. In six weeks the sum of £120,000 was subscribed. Two years later, Kitchener visited the Sudan to open the imposing new building which he named the Gordon Memorial College. It still stands as the focal point of the University of Khartoum, used mainly to house the university's very considerable library.

It was clearly a distant dream to speak of 'a centre of higher education' when there was in the whole country only one kind of school - the *khalwa*, where small boys, taught by a holy man, learnt by heart parts of the Qur'an. The educational policy of the new regime was laid down by James (later Sir James) Currie, who was Director of Education until 1914. He sought to provide vernacular elementary schools to enable the masses 'to understand the elements of the system of Government'; a technical school 'to train a small class of competent artisans'; and intermediate schools to train elementary schoolmasters and 'to provide a small administrative class for entry to the government service'. By the end of 1903, Gordon College had 149 students, of whom 91 were Sudanese and 58 were Egyptians or Syrians.

Progress in the early years was rapid, though always limited by the severe financial restrictions of a very poor country. In 1900 revenue stood, in round figures, at £150,000 and expenditure at £330,000. The education system was organised on a three-tier basis. In the larger villages of the northern Sudan, elementary vernacular schools provided a four-year course, primarily in the three Rs. In the provincial centres, there developed about ten intermediate schools with a four-year course, where the emphasis was heavily laid on the teaching of English. From these schools the best boys continued to Gordon College, again for a four-year course, where the emphasis was even more heavily on English. By 1913, the College had become a secondary school,

whose aim was unashamedly to produce young men to fill the junior ranks of the civil service. The ages of entry to the various grades of school were nominally seven, 11 and 15, but were extremely elastic.

Gordon College reached its maximum number in 1930, when there were 555 pupils, three-fifths of whom were drawn from the provinces of Khartoum and Blue Nile. Thus, outside the capital and a radius of about 100 miles around it, there was no boys' secondary school in the Sudan. The government was obsessed with the fear of producing an educated, unemployed class who would prove to be politically dangerous. Hence there was a deliberate policy of equating the number of educated Sudanese to the needs of the junior posts in the government service.

It is interesting to quote here the reaction of a young Lebanese, Edward Atiyah, an Oxford graduate, who came to teach in Gordon College in 1926. 'I disliked the Gordon College the moment I walked into it,' he wrote.¹

It was a military, not a human institution. It was a Government School in a country where the Government was an alien colonial government. The British tutors were members of the Political Service. They were there in the capacity of masters and rulers, and the second capacity overshadowed the first. The pupils were expected to show them not the ordinary respect owed by pupils to their teachers, but the submissiveness demanded of a subject ... The master himself, indeed, would one day be a District Commissioner and rule over them and their fathers.

I was appointed as a Tutor to Gordon College in September 1929. I was unusual in that I had not attended a public school, and was a graduate of London University, not of Oxbridge. I had also had a year of teacher training. Nevertheless, it was made clear at the interview that I would be a member of the Sudan Political Service. In fact, I wanted to teach, and I had no wish to be a District Commissioner. Fortunately, I managed to evade that fate, and during a career of twenty-five years in the Sudan government, I remained technically 'seconded' to the Education Department from the Political Service.

I found myself in a college of about 500 pupils. They were all boarders and were divided into five houses, each named after a Governor-general of the Sudan - Kitchener, Wingate, Stack, Archer and Maffey. I was immediately placed in charge of Wingate House. Each British tutor or house-master had a Sudanese assistant. Mine was none other than Isma'il al-Azhari - later to become the first Prime Minister of the independent Sudan. We worked closely together. Indeed, the relationship between the British and Sudanese staff was uniformly close and cordial. Gamal Muhammad Ahmad was head boy of my

House, and has had a distinguished career in the Sudan's Foreign Ministry, including the Sudan's representative at the United Nations, and ambassador to the United Kingdom.

The boys all dressed in a *gallabia* and *imma*, and the whole school paraded in a hollow square once a day. I was amazed to find that every time a boy passed a British member of the staff in the corridor, he was expected to salute and the salute was acknowledged. I used to stay in my office in order to evade the saluting ordeal. Another remarkable feature of the College was that the usual punishment for any offence, however trivial, was a beating. The punishment was inflicted by a huge black negro with a whip, which he used to dip in water beforehand to make it hurt more. I look back on this custom with horror; but at the time, it seemed perfectly natural, and the boys - young men - never bore anyone any ill-will for it.

I was a historian by training and inclination, but I was required to teach English. This, as I remember, was all literature. I remember trying to teach John Buchan's *Thirty Nine Steps*, which was full of Scottish dialogue which sometimes I could not understand myself! The only game that was played was soccer, played in bare feet, which was extremely popular and rapidly became the national game. So I introduced boxing, which I had done at University. I called for volunteers, and naturally biggest and toughest lads volunteered. I soon found that when they hit me it hurt a good deal. I therefore changed my tactics. I said, 'You're big and strong and don't need to learn boxing. It's the *little* boys who need to know how to defend themselves.' So after that, I went round the College on parade, and picked out all the smallest and weakest boys I could find for my boxing lessons, which from then on was a far more satisfactory arrangement - to me anyway.

In 1931 the whole College went on strike. The great depression had just hit the Sudan. The government decided to cut starting salaries of new Sudanese employees by 30 per cent, while the starting point of British staff was untouched. Since every boy in the College expected as a right to be a government employee, they protested by withdrawing to their boarding houses, appointing their own tutors, and refusing to attend lessons. They were perfectly polite, orderly and disciplined. Every night both boys and tutors sent out patrols - we used to exchange friendly greetings. Finally the strike was settled by senior Sudanese, who persuaded the government to reduce the cut in starting pay to 20 per cent.

I was in the College for seven years, 1929-1936, when I left to become a Province Education Officer. Those seven years were a period of stagnation in education in the Sudan, except for the foundation of Bakht er Ruda. The two Wardens (Principals) under whom I served were agreeable men, but neither was an educationalist. They were content to let Gordon College tick over, with no innovation or expansion. Through a good knowledge of English lay the only

path to government service and a respected career, but no science was taught; no art; no foreign language other than English; and no extra-curricular activities were held. Nothing approximating to English sixth-form work was attempted. It was a very pleasant, friendly place to work in, and certainly did not inspire in me or my contemporaries, or, I believe, in the students, the feelings of dislike and racial disharmony which Edward Atiyah felt.

The new secondary schools, 1946-1965

W. M. Farquharson-Lang

Hassan Zahir, the headmaster of the Omdurman Intermediate School, once visited Eton and on his departure from the College said to the headmaster, 'Well, you seem to be on the right lines.' Some months later he visited my school, Wadi Seidna, but paid no similar compliment.

There were similarities between the education in English public schools and the secondary schools of the Sudan before 1955. Both were elitist and highly selective. Both were looked upon as training grounds for leadership in government, the forces and the professions. They were largely exclusive, the boys being recruited mainly from the landowning classes (squires and sheikhs) and successful business and professional men. Schools were usually situated in the country, a safe distance from urban temptations, and the boys were brought up to regard the success of their house and school as a most commendable achievement in education.

As a stage in the development of both countries the elitist system has played its part in attempting to educate for excellence and for producing young men to be groomed for top jobs. History will probably recognise this stage as transitional and as something which may eventually be phased out, giving place to much wider opportunities for secondary education.

The expansion of secondary education in the Sudan between 1946 and 1955 was the beginning of the transition away from elitism. Before the war there had been one secondary school, the Gordon College. With the arrival of Christopher Cox as Director of Education and with the enthusiastic cooperation of his friend and colleague, Douglas Newbold, the recommendation of the De La Warr Commission to expand secondary education was adopted and funds found to implement the programme.

Inevitably progress was delayed by the war. The buildings of Wadi Seidna, just north of Omdurman, designed to provide secondary education for about 500 boarders, were completed at the beginning of the war but were not to be occupied as a school until 1946. For a short time they were shared between American airmen and Sudanese schoolboys - quite a happy alliance as it turned out, from which the school eventually benefited as the Americans left behind them (let it now be known) not only large quantities of tinned Californian fruit

but also a water-borne sanitation system for staff houses which was the envy of all our friends in Khartoum. Hantub, across the Blue Nile from Wad Medani, was opened about a year later, and Khor Taggat was opened some miles from El Obeid in 1949. Rumbek Secondary School for boys in the southern Sudan started on a smaller scale in 1947 and followed the same scheme of education as its northern counterparts. A girls' secondary school was opened in Omdurman in 1952.

In all, there would be places for 400 to 450 boys in secondary schools annually in the northern Sudan, a figure far short of the demand. One of the most difficult jobs the headmaster of a secondary school had to face was to refuse good applicants. As the number of government schools far from satisfied the demand for secondary education, some of the Sudanese community intermediate schools developed secondary departments, at first two day schools in Omdurman, the Ahlia and the Ahfad. Both received government subsidies and expatriate staff were seconded to strengthen the teaching. The indefatigable Sheikh Babiker Bedri opened a very successful girls' secondary school, starting in such a small way that it escaped the notice of the education authorities. There were other limited opportunities for secondary education in Khartoum for Sudanese children in some non-Sudanese community and religious schools.

The syllabus followed a traditional pattern except that the classics were not taught and the only languages were English and Arabic. The government schools were well equipped, with good laboratories and libraries. More than two-thirds of those leaving gained the Cambridge School Certificate, an examination qualifying for entrance to Khartoum University. At the start no more than two-thirds of the teaching staff were Sudanese; there were a few Egyptians and the rest were British with good degrees and educational qualifications, mainly engaged on contract.

Whatever the arguments may be against competitive sport, in the Sudan schools football and basketball played an important part and aroused a lively interest. There was drama and art, for both of which the Sudanese had a talent. I recall a very good performance of 'St Joan' in English at Wadi Seidna where the temperamental Joan was late for her call, only to be discovered telephoning her girl-friend in the headmaster's office while he watched the play. Unfortunately there was little development in music as a link between the two cultures.

1946 to 1955 was a period of great political activity. The war was over and the Sudanese were moving towards independence and a speedy end to the Condominium government. To a generation of young and politically conscious Sudanese schoolboys events seemed to be moving much too slowly. Although the government secondary schools were outside the towns, they were closely in touch with political events taking place in the capital. Ismail El Azhari, once a

good teacher of mathematics, chose politics. One of the most able pupils I came across was Abdel Khalig Mahjoub, a fine English scholar and a well-mannered boy who was deeply involved in politics from his school days. He became Secretary General of the Communist Party and was finally executed in Khartoum for subversive activities. With such influences at work, it is small wonder that from time to time there was unrest in the schools. A rumour from the Three Towns, or a minor incident in the school, could spark off trouble, and all but a few of the 500 boys would leave their desks and march round the school shouting anti-imperial slogans, finally to congregate on a football pitch to be harangued by some schoolboy agitators. No one was ever hurt, not a pane of glass was broken, but the work of the school was disrupted by these demonstrations and strikes and as a result some boys were dismissed and schools were temporarily closed.

At Rumbek in the southern Sudan, where the boys had more reason for wishing for the continuation of British rule, there were no strikes or demonstrations.

The evolution of the University of Khartoum

A. B. Theobald

As soon as the campaign in Eritrea and Ethiopia was over in 1942, I was recalled to the Education Department where I remained until I left the Sudan government service in 1956. I then signed a direct contract with the College and remained for a further three years.

During the six years of my absence from Gordon Memorial College great changes had taken place. G.C. Scott was Warden of the College from 1937 to 1943. In the words of Professor P.M. Holt: 'His enthusiasm and liberal outlook inspired the first generation of Sudanese and British teachers. The College ... acquired during Scott's Wardenship the full status of an academic secondary school.'² Christopher Cox, Director of Education from 1937-1939, infused a new spirit of bold initiative and progress throughout the whole Department. Cox appreciated that secondary education alone was not enough for the Sudan. He looked forward to a system of post-secondary education, leading eventually to a university.

Thus, when I returned to the Education Department in 1942, I found that what were loosely termed the 'Higher Schools' had been formed - Schools of Agriculture, Arts, Engineering, Science and Veterinary Science, to which the best students from Gordon College proceeded. They were widely scattered in separate buildings, and the numbers of students and staff were small because it was very difficult to recruit staff from outside the Sudan in war-time. The professed aim of the Higher Schools was to train Sudanese, not for the junior

posts in the civil service but for more responsible positions, which might make the holders eventually capable of replacing senior British officials. Thus the process of Sudanisation had begun.

I found myself to be a lecturer in History in the School of Arts and latterly the Dean of the School. I was able to introduce a course on the Mahdiya period of Sudan history. The teaching of this period had been forbidden in the old Gordon College because it was felt by the authorities to be too politically sensitive. I shall never forget the thrill of first learning and then teaching this most dramatic and fascinating period in the history of the Sudan. The students loved it too and they approached their studies with remarkable objectivity. I have always loved teaching but never, never so much as when I taught the history of the Mahdiya for the first time in the history of education in the Sudan.

In 1945 the various Higher Schools were fused into a single institution, to which the old name Gordon Memorial College was transferred. The Schools of Arts, Science and Law were in the old building; Engineering and Veterinary Science were nearby - only the School of Agriculture was some miles away at Shambat, beyond Khartoum North where there was spare agricultural land on its doorstep.

For five years, 1946-1951, I left teaching and became an administrator with the title 'Vice-Principal (Administration)'. In England I would have been called Registrar. In the office next door to me was Sayed Ibrahim Ahmad, who was 'Vice-Principal (Student Affairs)'. We were close friends as well as colleagues. He won the total respect of both staff and students. Indeed, he was the indispensable link between them, and between the British and Sudanese. He had a rich sense of humour, absolute integrity, and above all wisdom.

Towards the end of this period, we were visited for the first time by the late Professor (Dame) Lillian Penson of London University, who became that university's first woman Vice-Chancellor. Professor Penson took us under her wing, and became a regular visitor. Her constant advice was for the College to take risks, and to hasten as quickly as possible towards university status. There was a powerful local lobby who advocated hastening slowly, but they were routed by her forceful personality. She was an unlikely figure for a female Professor, for she smoked like a chimney and could match any man in the consumption of alcohol. It was largely due to her influence in the corridors of power in London University that in 1951 all the Higher Schools, together with the Kitchener School of Medicine fused together to form the University College of Khartoum. The students studied for the external general degree of BA or BSc of London University in three subjects. We were not yet strong enough to attempt Honours degrees.

We began to accept girl students and southerners. The southerners, alas, never integrated with the northerners and formed an isolated group, mixing only with each other. The girl students were at first regarded with awe, and they bore

themselves modestly but proudly as queens of the campus. I remember one day seeing a male student walking unsteadily down the corridor, looking very shaken, so I stopped him and asked him what was the matter. He gasped out, 'Sir, I've just been talking to a girl student.'

As the war ended and the movement for Sudanese independence gathered speed, Sudanese national parties were reflected in the College - the Umma, favouring an independent Sudan; the Ashiqqa, supporting union - or at least a link with Egypt; the right-wing Islamic fundamentalists, the Muslim Brothers; and the Communists. The various groups struggled for control of the Students' Union; but they were united in opposition to the Sudan government, controlled by the British. There were demonstrations in the streets, and strikes by the students. On the day the British invaded Egypt in 1956, I remember going into a class with some trepidation, and I found the students looking sulky and glum. I simply said, 'Let us ignore the terrible events going on around us and get on with our work.' They brightened up and smiled immediately, and the class continued normally. That afternoon there was a massive demonstration. The whole student body poured into the streets, waving banners, and chanting 'Down, down with Eden.' My wife and I stood at our gate and watched them go by. As they passed us they waved cheerily, and smiled and joked in the friendliest way.

In June 1956, after the Sudan had become independent, the University College of Khartoum became the independent University of Khartoum, granting its own degrees. I signed a direct contract for three years with the University. I handed over my posts of Vice-Principal (Sayed Ibrahim Ahmad had unfortunately left us in 1953) and Dean of the Faculty of Arts to Sudanese colleagues, and concentrated on teaching and research only. I had the pleasure of serving under the first Sudanese Vice-Chancellor, Sayed Nasr al-Haj 'Ali - the best boss I ever had, either in the Sudan or later in Britain. He was a brilliant Vice-Chancellor.

When I left the University of Khartoum in 1959, there were about 1200 students, including about 25 girls. When I revisited the Sudan twenty years later, there were 8000 students, including 1000 girls.

Notes

1. Atiyah, E., *An Arab tells his story* (London, 1946; Westport, 1981)
2. Holt, P.M., *A modern history of the Sudan*, (London 1961, 1963). Revised as Holt, P.M. and Daly, M.W., *The history of the Sudan from the coming of Islam to the present day* (London, 1979).

THE EDUCATIONAL AND SOCIAL DEVELOPMENT OF SUDANESE GIRLS AND WOMEN WITH EMPHASIS UPON THE YEARS 1953-1964.

L.M. Passmore Sanderson

Introductory

In 1981 a number of Sudanese women in all regions of the Sudan through the Women's Union and all branches of the educational services, were working hard to free all girls and women from ignorance, poverty, subservience, and genital mutilation. The aim was to enable them to enjoy health, literacy and basic education, and the right to choose to participate in economic life, whether in income-generating activities centring around the home, or in national career opportunities which secured for them a degree of intellectual and financial independence and job-satisfaction in addition to their domestic and child-rearing responsibilities.

In this work the national educational system has played a crucial role. By aiming to provide universal literacy, primary education for the majority, secondary and tertiary education for some, and post-graduate research for a few, knowledge could gradually extend from those with most education to those with least. In the Sudan of 1981, although much of the population was still illiterate, the educational system provided opportunities for a minute female elite to attain the highest roles in society. Moreover, there was the possibility of reaching girls and women, even in the most outlying districts, by the mass media.

This account highlights important developments during the Condominium up to *ca* 1964 when I left the Sudan. It comments upon social attitudes and the attitudes of girls and women themselves to education and to social change, and reports some significant recent developments.¹

The development most crucial to the ultimate eradication of social discrimination against girls and women - the abolition of all forms of female genital excision and infibulation - has yet to come. Some Sudanese men and women are now ending the 'conspiracy of silence' surrounding these practices. But the most important result will be, of course, the elimination of the needless suffering of little girls and women and the release of greater female creative energies for social service.

The southern Sudan, c. 1900-1964

Although in the South at the beginning of the century² and indeed until now³ female genital excision and infibulation existed only in areas which had been to some extent Arabised by northern Sudanese influence, nevertheless the status of women in many tribal areas was extremely low. The majority of the population is *still* very poor, and the nature of their work load and the weight of traditional customs conspire to force upon women an unfair share of the burden: injustice is condoned 'because it is African'. Initiation rights for girls, with their 'aura of mystery and religious solemnity' instil in girls a powerful psychological attitude of subservience. Bride-price restricts women to inferior status; polygamy is widespread, and there are men who have as many as 100 wives. Many southern Sudanese women have to carry water and fuel long distances daily, and the grinding of grain with stones still imposes upon girls and women a 'strenuous physical burden'. It is little wonder that southern Sudanese society in the early decades of the century saw no point in sending daughters to school. Even when elementary education became available for girls, the numbers attending at first fluctuated greatly.

However, during the first decade of the century when the Verona Fathers, the Church Missionary Society (CMS), and the American Presbyterians started missionary work in the South, a few girls attended boys' classes on the mission stations, and were taught the reading and writing of the bible in the various vernaculars, as well as elementary arithmetic, hygiene, domestic and craft work. The Roman Catholic Mission provided education on the largest scale (and did so until 1964 when missionaries were expelled from the southern Sudan). Most of the girl pupils at that time were daughters of mission employees or orphans in need of care. But there were coeducational 'bush' schools (village centres run by itinerant missionaries) teaching the reading and writing of the bible in the vernacular and rudimentary health education. Education was geared to improvement in home life. Every girl in a bush school could apply to come to the mission centres which provided boarding facilities, so although the provision was small, there was continuity for basic education even in these early years.⁴

In the second decade the government allowed women missionaries and wives of missionaries to join their husbands, so education for girls was taken more seriously. In 1914 Mrs Scammel, the first CMS woman to work in the southern Sudan, joined the staff at Malek where several girls had been studying previously: she encouraged women to learn to spin. Girls attended American Mission classes in Upper Nile Province too. In 1919 the first woman missionary of the Sudan United Mission arrived at Melut, and more effort was made then to persuade Dinka parents to send their daughters to school.⁵ Girls

and women were taught in simple enclosures before permanent buildings could be provided for them in the 1920s. A few girls were given some teacher-training in girls' elementary schools by missionaries.

From the 1920s the government provided grants-in-aid to girls' schools, and girls' education expanded and became more systematic. There was considerable consolidation in the 1930s. By 1930 there were 359 girls in six girls' elementary schools recognized by the government,⁶ and by 1936, in addition to the village sub-grade (bush) schools there were 705 girls in 18 elementary schools, 26 of whom were studying in boys' schools.⁷ A few of these girls who had received basic education in their vernaculars and had been exposed to Christian culture became teachers and hospital dressers.

In the 1940s missionary teachers were sent abroad for teacher-education and returned to train southern Sudanese teachers at the main mission central schools, mostly for village schools. But there were still no post-elementary schools for southern girls and barely 25 per cent of the entrants continued until the fourth year. Few girls therefore had had enough primary education to enable them to remain literate. Alas! Dr J.D. Tothill's extensive educational plans for the Zande, which included a target of 95 per cent literacy for *both* sexes within 30 years from 1943, were to remain largely unfulfilled. The majority of southern Sudanese girls and women are *still* not literate in a vernacular. But after World War II girls' schools grew at a faster speed. By 1948 even the Dinka were interested in sending their daughters to school. By 1948 there were 1,210 girls in elementary schools recognized by the government.⁸ In March 1948 Miss E.M. Golding was appointed British Superintendent of Girls' Education in the South. After 1948 southern education became more influenced by the northern Sudanese system and Arabic was introduced.

Girls' education in the South lagged behind that in the North. In the South intermediate education only began in 1953 at Maridi, which was to become an important educational centre for the South. Although secondary education for girls was planned for Juba in the 1950s, by 1964 there was no secondary education at all for girls in the South. The government provided elementary schools from 1950: Tonj girls' elementary school was the first, and by 1955 there were eight government elementary schools.⁹ By 1954 there were 48 girls in Maridi Intermediate school and small-scale facilities for primary teacher-training began there. In theory, when girls were ready for secondary education they were to attend secondary schools in the northern Sudan. But by 1964 no southern girls had entered northern schools: able intermediate leavers were invariably steered into primary teacher-training. A few girls managed to attend boys' post-elementary schools in the South.

In December 1955 Miss Roy, Superintendent of Girls' Education in the South, handed over the schools to the independent Sudan government, which

initiated major changes in educational provision. It was very difficult to find women teachers, other than missionaries. Until the Maridi centre could supply teachers trained for primary schools missionaries were allowed to continue to train teachers in an *ad hoc* fashion. In 1957 when boys' schools were being nationalised, Ziada Arbab, Minister of Education, decided to leave girls' elementary education to the Missions. Southern education had been disrupted as a result of the southern insurrections of 1955: women teachers could only work in or very near provincial capitals. The government Girls' Intermediate School at Maridi, with its attached primary training centre, was closed from 1955 until 1960. From late 1962 missionary school-mistresses were progressively eliminated from the South and were replaced by northern Sudanese masters. Language problems were acute and girls went on strike against unsatisfactory educational conditions. Although by 1961-62 there were 5818 girls in elementary schools, there were only 125 undertaking vernacular teacher-training and none being trained for primary schools. At this time of acute political and social distress a few girls continued their education by accepting teacher-education in Arabic in the North or by studying with their brothers in exile in Uganda. They struggled hard for education and social status.

Government provision before 1953 in the North

Before 1953 there existed a network of girls' elementary schools (providing a four-year course) in the main towns of the northern Sudan. From 1921, when Omdurman Girls' Training College opened, there was some teacher-training for elementary school-mistresses. The first intermediate school, Omdurman Girls' Intermediate School, began in 1939: six existed in 1953, each providing a four-year course. The first few girls to have any government secondary education stayed on at Omdurman Girls' Intermediate School in 1945, the nucleus of Omdurman Girls' Secondary School, which by 1953 was providing a five-year course.

This provision lagged far behind that for boys. This was partly due to the traditional roles of women in Islamic society. Financial resources for education for the whole of the Sudan were small, and the needs of boys and men always took priority over those of girls and women. But Sir James Currie, when the pioneering Sheikh Babiker Bedri showed him a class of girls learning needlework in his own home at Rufa'a, agreed to take over the group for the government. Hence began the first girls' school. Moreover, Currie realised that if the girls were to serve the best interests of the Sudan as a whole they would have to learn to help themselves, and when he saw them making caps for their brothers he instructed the Sheikh to see that they learnt to make clothes for themselves instead. With Sheikh Babiker's cooperation other elementary

schools began in outlying rural areas where they would be less noticeable to the urban political elite. But the first government girls' school in Khartoum began as a result of agitation by Egyptian government employees who wanted education for their daughters in an environment geared to Muslim cultural traditions.

Before the end of World War I there was little demand for girls' education, either from Sudanese parents (Sheikh Babiker was an exception) or from the girls themselves. Girls had to be persuaded to come to school at first, and even in the 1920s when Omdurman Girls' Training College was soliciting girls to become boarders in the College, girls sometimes ran away to go home. But as elementary education became more established, parents began to see its advantages for the improved quality of home-life which it encouraged. In the 1930s some girls wanted to continue their education at a post-elementary level, and by 1953 there was an overwhelming demand for intermediate and secondary school places.

Girls' education was to improve domestic life, to provide educated wives for educated husbands, and to teach women to abstain from harmful customs, the most harmful of which was the genital mutilation of girls.¹⁰ It was not fortuitous that the Omdurman Girls' Training College and the Omdurman Midwives Training School both opened in 1921: it was the untrained traditional midwives who performed the genital mutilations (see above p. 160). The British women who served in the medical and educational fields were a close community in Khartoum and Omdurman. Throughout the 1920s, 1930s and 1940s attempts were made by educational, medical, religious, legal and political personnel - British and Sudanese - to influence people against the practice. The work culminated in the Law of 1946 against infibulation.¹¹

1953-c.1964 in the North

As the Sudan neared political independence the demand from mothers and their daughters for school places, especially at the intermediate and secondary levels, became overwhelming. The provision was minute. In 1953, for example, (when my third year class at Omdurman Girls' Secondary School consisted of about thirty-four girls and women, aged from fourteen to twenty-eight - none of whom wanted to leave school to go back to the *hosh*, or segregated women's quarters of the home), only twenty-five girls were being accepted annually into the one secondary school, for a five-year course leading to the Sudan School Certificate examination. The curriculum was narrow: work in the sciences was gradually being developed for girls; physical education was very limited; there was no music. The financial provision for girls' schools was far less than that for boys. Moreover, immediately before and after independence in 1956, staffing problems were acute. Sudanese

secondary school mistresses had not been trained and expatriates were leaving the country. Sudanese masters, too, were in short supply, as secondary-trained masters were competing for more attractive civil service posts. Intermediate school-masters were therefore employed in girls' secondary classes and new staff were recruited from India and the Middle East. There was an acute shortage of qualified Maths, Physics and Chemistry teachers for girls, and although all had been strictly socialised into social passivity, yet in the early 1960s girls went on strike for better educational facilities, or in support of politically orientated boys' school strikes.¹²

After 1953 there was continuous expansion of girls' intermediate and secondary education, the curriculum in all schools gradually approximated to that of boys' schools. In 1960 the Minister of Education, Ziada Arbab, publicly declared that thenceforth financial provision for girls' schools would be equivalent to that for boys. (I went to the Ministry of Education on the following day to point out the discrepancies as far as the Khartoum Girls' Secondary School was concerned in books and materials, staff allocation and in teacher-pupil ratio. I submitted plans for future development.) This marked a change in attitude of those in power to girls and women, although many male administrators were still extremely conservative in their attitudes. The Khartoum Girls' Secondary School was the first modern school for girls. As its headmistress, I attempted to make it a model school for the Sudan. There were science laboratories, modern domestic science accommodation and exquisite gardens. The staff encouraged the girls to enjoy a wider international culture: some girls participated in cultural activities at the university, and speakers were provided for extra-curricular societies. But expansion in the other main towns precluded lavish facilities such as tennis courts.

During the 1950s and 1960s career opportunities for Sudanese women expanded considerably. Previously, the few female elementary school teachers, nurses and midwives, had received little training, so their social status was low. The first post-secondary education for the nursing profession began with the opening of the Khartoum Nursing College in 1956. In 1958 the Khartoum Technical Institute opened a Girls' Secretarial School to provide a two-year post-secondary course for secretarial work. By July 1962 ten secondary school-mistresses had graduated either from Khartoum University or the Technical Institute, a first-class graduate in Arabic of 1960 went for post-graduate training in librarianship to London. The Higher Teachers Training Institute, established in 1961 by the Ministry of Education in collaboration with UNESCO, provided the first secondary teacher education for Sudanese in the Sudan and was open to women as well as to men. The number of women entering the University of Khartoum increased from thirteen in 1953 to 87 in July, 1962. In 1962 the first Sudanese woman to become a

secondary-school headmistress took over the headship of Khartoum Girls' Secondary School. Thus women were beginning to be active participants in social change.

And yet in the 1960s the few most highly educated Sudanese women, who had had twelve years of school education followed by university education - even those with very good degrees - were not prepared to take a firm stand against any form of female genital excision and infibulation. The 1946 Law had condoned the removal of 'the free and projecting part of the clitoris', which many people interpreted as a 'Sunna': at that time it would have been quite impossible to have made all excision illegal. Prosecutions after the passing of the Law were brought only in blatant cases of cruelty, and needed the consent of the Governor of the province. In the 1950s educated Sudanese often claimed that the practice was dying out. I rationalised that if only a few girls had a relatively 'harmless' excision then the campaigns in the 1940s and the hard work of educationalists had not been in vain.

1964 to 1981

Since 1964 there have been important changes in educational provision for the Sudan as a whole. After 1970 the structure of the educational ladder changed to provide a six-year primary course of basic education for as many as possible, followed by a three-year junior secondary, and a three-year senior secondary course for some. There was increased emphasis upon the Arabic language, and the integration of Islamic institutions with the government system. English language teaching suffered. Previously, English as a second language was taught from a child's fifth year of schooling at the beginning of intermediate education, but latterly it began in the seventh year in junior secondary classes. There was enormous expansion at all levels, which has inevitably led to over-crowded classes and lowering of overall educational standards. In 1962, for example, Khartoum Girls' Secondary School had eight classes of thirty-five girls, but in January, 1980 when I revisited the school, there were over 1200 girls in nineteen classes, some classes having as many as eighty girls. The shortage of teachers was aggravated by a 'brain drain' to other countries where qualified Sudanese teachers can earn four times their Sudan salary. In 1982, about 80 per cent of the total population of the Sudan was illiterate.¹³ The difference between the provision for girls and that for boys at the post-primary levels had, however, diminished.¹⁴

Sudanese women, through the Women's Committee of the Sudanese Socialist Union, and through the influential posts held in all branches of the educational and social services, have become more active participants in social evolution. Some educated women have become less fatalistic in their attitude towards genital excision and infibulation and are more ready to take positive

action against *all* such customs. Through their WHO sponsored Seminar of 1979, Sudanese women helped women from other African countries to face up more positively to their own problems of genital mutilation. An extensive research project, organised by Dr Asma Dareer in most of the northern Sudan from 1977 to 1981, found that about 83 per cent of the female respondents had undergone the severe, pharaonic mutilation.¹⁵ A most important development was the Babiker Bedri Scientific Association for Women's Studies Workshop, Khartoum, 8-10 March, 1981. This voluntary self-help Association which was supported by the Sudan government was formed at the end of February, 1979 at a symposium on the changing status of Sudanese women, at the independent Ahfad University College for Women, Omdurman, under the leadership of Professor Yusif Bedri. One of its objectives was the abolition of all forms of female genital excision and infibulation: a special committee was established for this work. The Chief *Imam* of Khartoum promised to instruct the preachers of 14,000 mosques throughout the Sudan to preach against the practice. The Association undertook a three-year project of village welfare work and rallied support in a national campaign for abolition of the practice. May God help them all.

Notes

1. From 1964 to 1980, while engaged in teacher-education in Britain, the writer continued to work on Sudanese education, visited the Sudan in January 1980 and March 1981, and devoted most of a sabbatical year 1979/80 to research and work related to the abolition of all forms of female genital excision and infibulation in Africa.
2. Sudan Government Archives, C.S. 44/B/2, Circumcision of Women.
3. Lado, M.J., 'Impact of customs and traditions on the status of Sudanese women: re adapting tradition to modern life', in *Symposium on the changing status of Sudanese women*, 23 Feb.-1 March, 1979, Ahfad University College for Women, Omdurman (in six unpublished volumes). Margaret Juan Lado was in the Social Welfare Department, Juba, southern Sudan.
4. See also the author's *A history of education in the Sudan with special reference to the development of girls' schools*, (London, M.A. 1962); and, with G.N. Sanderson, *Education, religion and politics in southern Sudan, 1899-1964* (London, 1981). A full bibliography is given in the original of this paper, held in the Durham Sudan Archive.
5. Maxwell, J.H., *Half a Century of Grace*, (London, 1953).
6. Report of the Education Department, 1930.
7. Ph.D. thesis, pp.456-8. The Catholics were educating 407 girls, and the Protestants 244 in CMS schools, 35 in American Mission schools and 19 in Sudan United Mission classes.

8. 1948 Report of the Education Department, pp.262-4: 864 by the Verona Fathers, 30 by the Mill Hill Fathers, and 316 by the CMS.
9. In the North there were also European, Coptic and Sudanese non-government secondary schools admitting Sudanese girls. There were none in the South.
10. For more information about female genital excision and infibulation, see the writer's M.A. thesis, *op.cit.*, Chapter III. 'Pharaonic circumcision: politics and cultural intransigence in the Sudan'; for *Anti-Slavery Society, London*, July, 1974; Hermione Harris and Caroline Bond, 'Female circumcision: a report of information available', for *Anti-Slavery Society*, (edited by the writer, 1975); 'Education in the Middle-East with special reference to the Sudan, Egypt and education for the eradication of female genital mutilation', *Associateship, University of London*, 1979-1980. *Against the mutilation of women: the struggle to end unnecessary suffering*, (Ithaca Press, March, 1981); 'Female genital mutilation: possible break-through for the ultimate abolition of the practice in the Sudan', *Women Speaking*, April-June, 1981; Report (for *The Minority Rights Group*, London) of developments in the Sudan for the ultimate elimination of all female genital mutilation, 16 June, 1981: translated into French in *Rapport Nr 47*, pp.22-4, November, 1981; 'Genital mutilation of women', *Lancet*, 4 July, 1981; Asma Abdel Rahim El Dareer, 'An epidemiological study of female genital excision and infibulation ('Circumcision') in the Sudan', (edited by the writer, August 1981, to be published); 'Progress of work in the Sudan for abolition of female circumcision', *Tropical Doctor*, October, 1981, p.186.
11. The original version of the paper contains the history of the campaign.
12. There had been strikes in boys' secondary schools since the 1940s. In 1960, as a result of protest, an experienced British graduate science master was transferred to the Khartoum Girls' Secondary School.
13. 'Illiteracy', *Sudanow*, February 1981, pp.9-13.
14. In 1981 there were 521 government Intermediate (Junior Secondary) girls' schools educating 92,888 girls and 64 (Senior) Secondary schools educating 28,925 girls.
15. Asma Abel Rahim El Dareer, *An epidemiological study of female genital excision and infibulation ('circumcision') in the Sudan*, (edited by the writer, August, 1981.) The study was assisted by WHO, IPPF, the Dutch Ministry of Foreign Affairs, the Sudan Ministry of Health, and Faculty of Medicine, Khartoum.

IN DISCUSSION: EDUCATION

(Chairman: A.B. Theobald)

Robin Hodgkin: V.L. ('Taffy') Griffiths has written a comment on my paper which I think should go into the record. He writes, 'I think that you take too unsympathetic a line on Lugardism. At its best, even second best, it was a great relief from the largely thoughtless copying of everything western, good and bad - Dougie Udall's boast that the GMC was 'the Winchester of the Nile', etc. Up to about 1935 the British were very much the dominant rulers and hardly thought it necessary to consult the Sudanese. I myself having just spent four years in India, at the time of Simon Commission, was only too conscious of the likelihood of independence coming much quicker than expected.' Independence underlay many of our Bakht er Ruda activities and of our concentration on the small elite, the top ten. Griffiths's last point concerns the language problem. 'Throughout this period,' he says, 'but more particularly in the pre-war years the difficulty was how to get Sudanese reactions to any proposal. Often they had never thought of it and didn't know what to think. They were usually not good at thinking out applications or side effects except Abdel Rahman Ali Taha, who was superb at this, and to whom I owe a particular debt.' **Sirr Al-Khatim Al-Khalifa:** As far as conscious training for independence or for democratic institutions was concerned, we felt that the whole aim of civics and outside activities was to give the students some kind of training in running small democratic institutions with a view to preparing them ultimately for an independent democratic Sudan. This was in the back of the minds at least of many Sudanese.

Rowton Simpson (1925-1953): I do feel that this paper rather reads as if the whole thing began with Bakht er Ruda, whereas in fact all these very fine chaps that we have all been talking about and we worked with were all a product of the educational system prior to Bakht er Ruda.

Alan Theobald: When I was Province Education Officer in the Northern Province for four years after 1936, there was an entirely new atmosphere among those who experienced Bakht er Ruda compared with those who had not.

Alleyne Nicholson (1923-1949): I see there is a rather scathing remark made about the Advanced Khalwa. But some of them were actually quite good. They did teach the boys to read and write, and after 1931 I would not recruit a policeman into my police force who couldn't read and write Arabic.

Alan Theobald: I think they were exceptional, the Khalwas in Northern Province, very different from those in the rest of Sudan. I feel that throughout most of these papers, the South has been neglected and that we have paid a great deal more attention to the North, naturally I suppose.

Nancy Robertson (1926-1950): Dr Sanderson paid a tribute to the few women who worked in the very early days. I remember so well how successful Miss Evans was in 1928 or 1930 in a practical way by arranging that the girls who had come to her teacher training college should receive a dowry (I think it was £30.00) after working for the government for two years or more, which gave a practical reason to the fathers to send their daughters. I also remember very well once or twice going to speech-days in which there would be a little tableau of two girls, one crying and the other using a sewing machine. The crying one was going to marry a very old friend of her father's; the other with the sewing machine was going to marry a sub-mamur.

Elizabeth Hodgkin (1944-1955): In 1944 I and four colleagues went to try to expand the primary network of education over the Sudan. I had to go on souk lorries because there weren't enough cars even for the men officials. But we had some enormous advantages. The greatest of all was the amazing gift of Sudanese girls for teaching. Miss Evans and her successors in Omdurman at Girls' Training College had a wonderfully efficient system of training young girls with perhaps three or four years of primary education to be teachers who could pass on much of what they knew. Some of it got rather mangled on the way, but they had an incredible spontaneity and gift for getting the bare essentials efficiently organised and putting them over in remote villages.

Lilian Sanderson: The girls and the women saw the need for more education. Crowds and crowds of intermediate school girls and their parents, their mothers, and grandmothers besieged the home of Sayed Ahmed Mirani, the first Sudanese Controller of Girls' Education in the 1950s, demanding places for their girls until very late at night. He never seemed to be able to stop. Nor shall I forget, early in 1960, months before the buildings of the Khartoum Girls' High School had been completed, the faces of groups of Sudanese secondary school girls sitting outside in the heat of the 3.00pm sun, and when I asked them what they were there for they were 'waiting for the school to open'.

Evelyn Simpson (1930-1953): I should like to mention the contribution of the (non-government) Unity High School. Miss Junor started them taking the School Certificate - of course they hadn't any science subjects. When Miss Brassington arrived in 1948 (she was a terribly enthusiastic person) she coopted all sorts of District Commissioners' wives and other women to do part-time work. In no time at all she got Fatma Talib, aged 22, through the School Certificate and entered into the University College of Khartoum. She was one of the first twelve students who received degrees and was very famous young woman. Miss Brassington realised at once that with independence the girls all wanted to be doctors, but when they applied to the University College they couldn't be accepted because they hadn't got Maths. I had a Maths degree, and Miss Brassington wouldn't give me any rest until I agreed to go and start a class for the girls. I had them on a Saturday morning. I crammed them and I got four

of them (one was a Sudanese, one was an Armenian, and the other two were Greeks) through the Maths in the School Certificate in one year, and I don't think that was bad going!

Elliot Balfour (1932-1954): In about 1936-37 I was seconded to the Education Department. That was one of the best things that ever happened to me. But I think that we were in danger of building two nations, and producing an educational elite picked almost entirely from the towns. I have heard a lot about not asking Sudanese opinion and advice. I asked Sudanese opinion and advice every day of my life when I was in the district. I got out of my lorry, I got off my camel, I was surrounded by crowds of people, and I said, 'The *hukuma* wishes to do this.' And when I heard what they said, I replied 'Oh, very well, the *hukuma* is *not* going to do this.' If that is not taking advice, what is? Finally, let me strike one blow in favour of my own Service. Sitting next to me here is a lad I taught at the Gordon College, and by heavens he is a General! [General Mohammed Idris].

Dr Farquharson-Lang: In my latter years in the Sudan I had some charge of non-government schools and it was always a matter of great fear for me when I heard that Sheik Babiker Bedri, that very great educationalist, wanted to see me. He would come down the corridor and he would say, 'We have started a new class with 30 boys, and we have started the buildings and we are recruiting new teachers, we hope to get one from the UK,' and I would nod my head rather wisely, knowing that John Carmichael wasn't going to hand out the money very readily for this sort of thing. I would have to say to him, 'Well, I am afraid in the budget for this year, there is no provision for the expansion of the Ahfad Secondary School in this way,' and he would say, 'Well, this is terrible, what am I going to do? Am I going to dismiss these 30 children and am I going to tell the contractors not to continue the building?' So he would get up and he would stomp out of the office rather disgruntled and he would go up to see the Director of Education, who would tell him in kinder terms that there was no money. Then he would go to the Civil Secretary, and if he didn't get satisfaction from the Civil Secretary he would probably go along and see the Governor-general. Eventually it would come down the line that a grant would be made for this school 'as an exception'. But the exception would probably be repeated in the following year! He was a man who saw that the Sudan badly wanted all forms of education at all levels. There is one omission I would like to mention - technical education. Latterly, a Khartoum Institute of Technology was founded to supplement the technical schools in Omdurman. But also, as we have been told, a lot of the Departments liked to train their own people. (See Hobro, above, and discussion on communications; also Wright, J., 'A note on the possible effects of different promotion prospects before and during independence' in Lavin, D. (ed.), *The Condominium remembered*, Vol. I, *The making of the Sudanese state*. [Durham, 1990])

Part V:
MISSIONS

MISSIONS AND CHURCHES IN THE SOUTH

The Rt Rev. Oliver Allison

At a missionary festival in England, a former Governor of Equatoria, under whom I served in my early days, referred to the command of Jesus Christ to 'go into all the world and preach the Gospel to the whole creation'. Martin Parr said, 'The command applies to *all* who go out from here to work among, with, or for the African; for all, whether government servants, settlers, evangelists or teachers, are missionaries. They must all work together and be seen to work together with a common purpose ...' This was true in my experience of the Sudan as a whole.

The Church Missionary Society (CMS) has from the beginning been a 'layman's society', started by laymen of the calibre of Wilberforce, and continued very largely by laymen (and in due course by laywomen). The same has been true of the young church that arose from the early endeavours of the pioneer missionaries. It remains to this day in essence a 'layman's church'.

First beginnings, 1899-1929

I shall cover the work in the South, and the CMS Gordon Memorial Sudan mission. It was under that mission that I served my apprenticeship, inspired by the example of the great pioneers, Llewellyn Gwynne and Archibald Shaw (affectionately known by his beloved Dinka as 'Macuor', his bull name). Shaw started from scratch in January 1906 at Malek near Bor on the White Nile, surrounded on three sides by water and swamp, as I know having lived there. Gwynne brought with him three clergymen, a doctor, a technical expert and a young farmer. Wilson Cash wrote:¹

New moral and spiritual forces must be planted in the life of the people if we are to avoid a policy that would make the nation purely material and secular ... The changes that most people saw coming in the Sudan had not to any great extent affected the pagan tribes, but those who looked into the future saw that the old order must pass away, and give place to an entirely new condition of life.

Many of the leading educationalists of that time whole-heartedly endorsed that view - hence the decision to allow the missions a free hand to get the ball rolling, not only by opening the first village schools, but also by simple medical services. These were designed not only to relieve suffering, but to initiate preventive measures where mortality among the people was appalling.

Far from merely preaching the Gospel, most of the early missionaries were jacks of all trades, and put their hands to all manner of jobs, including amateur church-building. It was said by a Public Works Department builder that the magnificent church at Yambio built under the supervision of Canon Gore in the 1920s was not only built by faith, but was *standing* by faith. The main structure and tower survived intact throughout the first seventeen years of the civil war, although the interior was the haunt of buffalo and elephant and the grass roof gutted! Slowly the first missionaries won the confidence and trust of the local chiefs and people by their devoted service and open friendship and care for the welfare of all. Malek became for many years the base from which the work extended and the parent Society chose men carefully for the tough conditions which then existed in the southern Sudan.

Once Malek was established, Shaw began to look further afield and at the end of a long trek of exploration on the west bank decided on a new site at Lau, some miles inland from Yirol, which boasted a gigantic banyan tree under which it was reckoned a whole battalion could bivouac without discomfort. (Having seen the site, I can well believe this!) In 1912 two new recruits, from Australia and England, were posted to Lau, but were later withdrawn as it proved an unsuitable and inaccessible spot. In 1913 another Australian, Clive Gore, arrived to open the first mission station in the Zande area at Yambio, not far from the Congo border. The net was being spread wide.

1917 saw the opening of the first mission amongst the Bari-speaking people at Yei under Paul Gibson from Britain, and 1920 the beginning of the first purely medical work at Lui in the Moru country. The 'beloved physician' Dr Fraser was the inspiration behind the network of out-stations which became a future model combining village dispensary, school and church at key places chosen by local chiefs and the doctor. (By 1939 there were 21 of these centres in the Moru area). Just as the doctor pioneered the medical work, so Paul Gibson pioneered the village evangelism, encouraging local men to initiate the founding of new schools-cum-churches throughout the Bari-speaking area. The encouragement of spiritual leadership at the local level was a vital factor during the later stages of the development of the indigenous church, to which we shall refer later.

1920 was the beginning of work at Juba, a small village which developed into the provincial headquarters of Equatoria Province transferred from Mongalla, and later became the regional capital of the South.

A second mission station was established in the Azande tribal area at Maridi in 1921, but it cost the life of the pioneer, Hadow, who died three years later of blackwater fever unattended. (Dr Fraser attempted the journey by motor-cycle and on foot, but arrived too late.) Arthur Riley took up the challenge of Maridi - yet another Australian who rode all the way from Mombasa to Yambio on his motor-cycle. One of Arthur Riley's first tasks was to finish the building of the

church at Maridi which stands to this day. Unfortunately Gore's magnificent first permanent church at Yambio, built with the aid of a simple book on the art of building, was eventually destroyed by fire and sabotage during the civil war.

The first craftsman to initiate the beginnings of a trade school was S.L. Ewell (always known as 'Yuli'). His school at Yambio later transferred to Loka and eventually found a permanent home at Lainya. This new venture was strongly recommended by the government, and proved of great value in the building up of the outer structures of the mission and church.

A tribute must be paid to the wives of the early missionaries who made their distinct contribution not only by supporting their husbands, but also by showing the Sudanese something of the uniqueness of the Christian home, and encouraging the womenfolk in building up their own homes on Christian principles.

New advance, 1929-1939

The advance was initiated by the Ministry of Education's new policy of giving small grants to trained educationalists, and encouraging the start of elementary education for boys in the vernacular languages of each main tribal area of the South. In 1929 three new mission stations were opened at Kajo Kaji (Bari-speaking area), Akot (Dinka west bank area) and Juba. At the same time the original school at Juba was transferred to Loka, where boys of all the main tribes of the South began their further education in the first intermediate school, the well-known CMS Nugent School, from whose pupils many future leaders both in government and church service were drawn in the years ahead. Juba Elementary School then moved to its new site. Ler Mission (the first in Nuer country) was opened in 1932, and like Akot became both a medical and educational centre in a very isolated area of the Sudd region. Dr (Mrs) Macdonald and the Rev. Macdonald together made a great contribution to this combined medical/educational/pastoral emphasis at Akot, at Ler, and later at Katcha in the Nuba Mountains. In 1935 a second centre was opened at Juaibor in the centre of Zeraf Island under the leadership of more pioneers of the CMS. Following the death of Charles Bertram, husband of Dr May Bertram, another victim of blackwater fever, this centre was moved to Wanglel as being more accessible.

Throughout this period missionaries were involved in mastering the vernacular languages - no easy task in the Nilotic areas. Primers and simple literature were produced for schools, complete New Testaments (Dinka Bor being the first) and Old Testament stories, which were always popular as they are so near to the African background. The Bible certainly came alive in the Sudan setting, as did the superb story of Jesus himself. So far the numbers of converts were small, and the mission was careful to ensure that all catechumens

and candidates for baptism were, with the exception of the old folk, literate. So the Word of God spread slowly from home to home, family to family, district to district, preparing the groundwork for the next stage.

The growth of the church, 1939-1949

This period covered the whole of World War II and its aftermath. Missionaries were asked to remain at their posts (indeed, urged strongly by the authorities in the South), and were thus able to provide stability in what was a very uncertain situation. This was the golden opportunity for the indigenous church to grow with the progress of vernacular teacher training in each main tribal area, and more important still, for the pastoral training of the Sudanese for the ordained ministry.

Under the inspiration and strong leadership of Bishop Morris Gelsthorpe, following the tragic death of Bishop Guy Bullen in the RAF accident on his way south in 1938, the mission immediately set to work to establish such training, first at Yei and then at the new Bishop Gwynne College which was set up in 1948.

By 1941 the first two Sudanese had been prepared for ordination and were ordained by Bishop Gelsthorpe as deacons. A third was prepared by Canon Leonard Sharland and was ordained in 1943. He finished his training for the priesthood at the Yei Divinity School, with other men and their wives who started their training courses there. These six men continued their training at Mundri Bishop Gwynne College in the medium of English, and were the first to be ordained in their own tribal areas, partly in the vernacular. By 1949 the Church in the South had its own nine 'pastors' (as they became known). Simultaneously the first Lay Readers were being licensed for assisting officially at statutory services, including expatriates as well as Sudanese - a reminder that the Church is supra-national, and crosses boundaries of colour and culture. More and more laymen were set aside for whole-time lay evangelism in their own village communities, in their dual capacity as teachers and trainers of the local people for baptism and confirmation. It was recognised that by and large they were the best judges of the suitability of people, with the advice of the Village Church Council members, who were elected annually by the local Christians for their spirituality and Christian commitment.

Stress was laid on the need for the coming Church of the Sudan to be self-governing, self-supporting and self-propagating. Indeed the founders of the CMS insisted from the very beginning in 1799 that missions were only the *scaffolding*, enabling the future national church of the country to which they were sent to be raised on secure foundations. This was the ideal set before us all, even though the scaffolding may have been a bit shaky at times!

At the same time as Bishop Gwynne College was founded at Mundri the Ministry of Education decided in conjunction with the CMS to start its own primary teacher training college nearby, and the Diocese of the Sudan was asked to help in providing qualified staff from the UK. This joint undertaking proved valuable in strengthening the links already made over the years and the Chairman of the College Council was alternately the Assistant Director of Education (South) and the Assistant Bishop in the Sudan (South). A similar arrangement was made on the Roman Catholic side at Bussere near Wau. Shortly before independence both Colleges were moved to a central site at Maridi.

Another sign of growth was the development of girls' education, and a girls' teacher training programme at Yei under the experienced guidance of a CMS missionary seconded from Uganda, together with her Ugandan assistant teacher. This period also saw the beginnings of the training of Women Workers under missionaries supported by the Mothers Union in the UK. The first licenced Sudanese missionary Women Workers were soon to give valuable and devoted contribution to the growing church.

Here one should refer to two significant movements which came into being at the beginning of this period; one a movement called 'Revival' which started at Yambio; the other an 'Awakening' which started at Akot. Both proved a means of growth, though in the case of the former certain excesses, and what could only be called uncharitable and potentially divisive attitudes openly condemning both missionaries and local administrators led to the expulsion of a missionary and a valuable young teacher at the Nugent School. Fortunately by gentle and truly Christian forbearance on the part of those condemned at the time, no permanent splinter movement divided the church. The 'Revival' movement in Uganda provided an added spiritual influence for good from over the border, though it too had its excesses - probably an inevitable concomitant. Looking back one can see that these movements provided for a deeper commitment of the Sudanese Christians who were dramatically affected by this experience. Similar spontaneous movements brought new life to whole communities, particularly in the Moru and Bari areas. (They still do). In the case of the 'Awakening' which spread from Akot to the surrounding Dinka villages, although some believers relapsed under the pressure of tribal custom and tradition, many were transformed and became future leaders in church and state. A number of young schoolboys of that time are now leading citizens in various walks of life.

The CMS bookshop in Juba and the CMS printing press at Yambio helped in the development and distribution of the scriptures and Christian literature in the drive towards adult literacy in the vernaculars. The bookshop also stocked materials for all the schools and colleges over that period, and proved a valuable aid to government, mission and Church.

Sudanisation of the church, 1949-1955

The first Sudanese parish was inaugurated at Bafuka in 1949 under its own Zande pastor with a duly elected Parish Church Council and two newly licenced Lay Readers. The apparent tragedy of the death of the pastor's wife on the very day of the inauguration turned out to be a triumph of the power of the Gospel to conquer the fear of death. The next parish to be inaugurated was at Mundri in the Moru country, but only after a solemn assurance that the local Christians would support their new pastor financially. He was Elinana Ngalamu, later the Archbishop of the Episcopal Church of Sudan.

With sixteen ordained clergy, the time was ripe for the Sudanese to be responsible for all the former mission stations. So from being CMS they became first CMS/ECS and then ECS (the official title of the Episcopal Church of Sudan, as it is today). The first two Nuba ordinands were just completing their training at Bishop Gwynne College and ready for ordination early in 1956 - the beginning of an indigenous ministry in the South after only twenty years of missionary endeavour in the Nuba Mountains. The numbers of people for baptism and confirmation increased significantly every year, as my records of confirmations show: from 1000 in 1949 to over 5,000 in 1955, the maximum being one year up to nearly 7000. This gave an indication of the steady development of an indigenous church.

Already Christian laymen were playing their part in politics. A leading Christian made his mark in the Legislative Assembly in a speech referring to the South as the 'weak wing of an eagle', which made the headlines in the press. He was right, and the other Members knew it! In the ensuing Parliament there were twelve members of the Senate who were Christians, and twenty in the House of Representatives, about one-fifth of all the members - an indication of the place of Christians in the coming independent state.

A landmark in the history of the Episcopal Church was the consecration of Daniel Deng Atong with three other African Bishops in the Ugandan Cathedral at Namirembe in May 1955 amidst great rejoicing. Three months later came the mutiny and uprising in the South which nearly broke his heart, and regrettably caused in the end a serious breakdown.

The obvious portents of what was to come meant the drawing together of missions and churches of all the main denominations, which was all to the good and long overdue. The original 'sphere system' evolved by the government to avoid the possible repetition of the tragic events in Uganda, may have been partly responsible for the lack of communication. With the development of communications and movement of Sudanese-educated Southerners it was bound to fade out when it had served its original purpose. Accordingly, in about 1940 the American United Presbyterian Mission, the CMS, and to a limited extent the Sudan United Mission (SUM) in the Nuba Mountains, decided to

form an Inter-Mission Council. By 1944 it was agreed very wisely to include an equal number of Sudanese, so the Southern Sudan Christian Council was formed. Two years later, in 1946, the Northern Sudan Christian Council replaced the previous Khartoum Church Council, which was entirely composed of British with no Sudanese participation. Both Councils eventually combined to become, together with the Roman Catholics, the Sudan Council of Churches, which was able to play a key role in reconciliation. Other churches were invited to join, including the Orthodox and other Catholic Churches.

In 1955 the Presbyterians decided to join forces with the Episcopalians in theological training at Bishop Gwynne College, where men from the Upper Nile Province started training for the Presbyterian ministry, and also the first pastor of the SUM in what became the Church of Jesus Christ in the Nuba Mountains. Such links were of mutual benefit in welding together the young churches, whilst maintaining their distinctive traditions. The hope for a United Church of the Sudan still remains a dream for the future. I am not able to cover the work of the Presbyterian Mission in Upper Nile, but when I was privileged to visit all their mission stations up to the Ethiopian borders, I observed that they followed the same pattern of development as the Anglicans, working towards an independent, autonomous Church which is now the Presbyterian Church in Sudan. They kindly took under their wing the work of Ler and Zeraf Island which CMS could not cover with depleted staff. Likewise the CMS also handed over part of the work on the East Bank of Equatoria, confined to the Torit area, to the African Inland Mission, with whom we had very good relationships. This has developed after many vicissitudes into the Africa Inland Church.

Finally, brief reference must be made to the traumatic events of August 1955, the mutiny and uprising in the southern Sudan, only four months before the end of the Condominium. The reasons were impartially diagnosed by the judicial enquiry set up by the government, and were accepted. It is not for any to judge of guilt. I wrote at the time:²

The tragic events of last August and what followed have indeed cast a deep shadow over the whole Sudan, and have brought much sadness and suffering to many people both in the North and South. The loss of life was deplorable, and the suffering which ensued has been grievous; but at the same time against the dark background has shone the light of Christ ... The Sudanese Pastors without exception stuck to their posts, and sought to prevent further bloodshed and looting, and later encouraged the people to return from hiding in the bush. Their faith and courage were of a high order throughout the troubles. The missionaries, too, remained at their posts and were able to save many lives as well as tend the wounded.

I was thankful that the Morning News recorded the courage of missionaries at a time when there was much adverse criticism in some quarters. I did not tell of the risks which some of them ran in order to save lives of both Sudanese and Greeks. But I did express the hope that in the end those events would prove redemptive, as indeed they did.

I should like to conclude by stating my conviction that the Church had a vital role in bringing about the Peace Accord of 1972, as recognised by the President himself and his government in official statements.³ The words of a senior Sudanese Christian minister in 1972 can perhaps sum things up. Referring to the 17 years of strife and suffering, he said, 'In all these vicissitudes the Church of Christ stood the test.'⁴

Notes

1. Cash, W., *The changing Sudan*, (London, 1930).
2. Diocesan Review, January 1956.
3. See, for instance, *Peace and unity in the Sudan*, Ministry of Foreign Affairs (Khartoum, 1973), and *Through fire and water*, CMS (London, 1976).
4. Address at the official opening of the Diocesan Synod in Juba Cathedral, November 1972.

PROTESTANT MISSIONARY WORK IN THE NORTHERN SUDAN DURING THE CONDOMINIUM PERIOD

Ronald C. Stevenson

Preparation and beginnings

The Gordon mystique in 1885 encouraged the hopes of Protestant missions in the eventual 'avenging' of his death and the opening up of the country to their missionary efforts. Only a few weeks afterwards a meeting of the Church Missionary Society (CMS) in London proposed a Gordon Memorial Mission to the Sudan and 3000 was at once subscribed to start it. Gordon, indeed, had written to the CMS in 1878 as Governor-general inviting them to consider missionary work in the province of Equatoria, of which he had been Governor.

Following the CMS meeting of 1885, Major-General F. T. Haig undertook two tours to the Red Sea area in 1886-87 and 1890-91 on behalf of the CMS. It is interesting to note, in view of subsequent linguistic debates, that in his report he insisted that the language of the future Sudan mission must be Arabic. In 1895, when rumour had it that an offensive against the Mahdists would not be long delayed, Haig proposed a plan to the Church Missionary Society for the evangelization of the Nile valley, and a mission at Suakin.¹ When Kitchener occupied the Sudan in 1898, the Protestant missions looked with new hope to the Sudan as a land of opportunity. They knew, of course, of the great efforts of the Roman Catholics from about the middle of the 19th Century - the Austrian Mission in Khartoum, the training programme envisaged by Bishop Comboni. The thought that part of this was an ancient Christian land may have appealed to the few who were aware of the old Nubian Church.

The immediate CMS initiative came from Cairo. On 29 September 1898 (soon after the battle of Omdurman on 2 September), Dr F.J. Harpur of the CMS hospital in Old Cairo asked whether his Society could send a mission to the Sudan. Khartoum and other Muslim areas in the north were ruled out, but Cromer eventually agreed (with much reluctance and bad grace, it seems) that mission work could be undertaken south of Fashoda.

So far as the North was concerned, Kitchener also did his best to delay any mission activity as long as possible. The mission authorities resented this reluctance. No doubt they did not appreciate that in the aftermath of the Mahdist period a fervent Muslim population was ready to regard any attempted Christian efforts with deep dislike and suspicion. Missionary work involving direct conversation with Muslims about Christianity even in private, remained

prohibited until 1903. Any kind of public Christian proclamation was forbidden, and therefore the work of CMS and other missions was largely institutional. Relations with government remained ambiguous as late as 1965.

CMS activities in the North began with the arrival, late in 1899, of Dr Harpur and the Rev. Llewellyn H. Gwynne (Bishop after 1908 to World War II). Gwynne began medical work in a mud house in Omdurman. Towards the end of 1900 he returned to his work in Cairo and the medical work was continued by Dr Alexander C. Hall who had come to the Sudan with his wife Eva. Dr Hall died in 1903, but the medical work continued under Dr Edmund Lloyd and others with the building up of a hospital and its establishment in new quarters planned from 1912. Llewellyn Gwynne was a pioneer and a fighter. He watched over the development of diocesan chaplaincies and churches at Wad Medani, Wadi Halfa and Port Sudan, and All Saints' Cathedral at Khartoum, consecrated in 1912, its foundation stone having been laid in February 1904.

In its educational work in the northern Sudan the CMS concentrated on girls' schools, leaving the American Presbyterian mission by agreement to develop boys' schools. In this way Gwynne became, as he used to relate, the first 'headmistress' of the first of these schools. This small girls' school opened in Khartoum in 1902, developed as the Khartoum CMS Girls' School, and in 1928 was handed over to the diocese and renamed the Unity High School for Girls, as which it continues to flourish. Gwynne was also responsible with Eva Hall and her sister Lillian Jackson for opening schools in Omdurman and Atbara in 1908, and in 1912 Eva Hall opened a girls' school at Wad Medani.

The American United Presbyterian mission began work in Khartoum about the same time as the CMS. Dr John Kelly Giffen and Dr Andrew Watson arrived in Omdurman in January 1900, where they worked with Gwynne and Dr Harpur. The Rev. G.A. Sowash, with experience in Egypt, came to Khartoum in 1903 and was to give 30 years of outstanding service to the Presbyterian Church in the northern Sudan. Congregations were started in several towns: Atbara, Wad Medani, Wadi Halfa, Port Sudan, Kareima. 'On 10 December 1907, the Khartoum church became an organized, self-supporting congregation - the first in the Sudan.'² In March 1912 the congregation and work were organized into the Presbytery of the Sudan. These *Injili* (evangelical) congregations were formed mainly from expatriate Egyptians.

The mission had been able to purchase a full block in a central location in Khartoum, where a boys' school was opened in 1905. A boys' home, started as a private venture, was accepted officially by the mission in 1911. Property was also acquired in Khartoum North where on 1 September 1908 a girls' boarding and day school was opened. As the mission activities developed, much attention was paid to work among women and girls, home training, Bible teaching in houses, and the training of 'Bible women' for this purpose. The

mission was able to draw upon Egypt for some of its workers. Accompanying Dr Giffen in the first pioneering days was the Rev. Gebra Hanna, appointed by the Evangelical Church of Egypt as its first foreign missionary. In 1917 there came Sitt Faruza Girgis, 'the first Egyptian woman missionary to the Sudan'³, to assist Mrs Giffen to inaugurate women's home training.

Later developments

Other pioneer projects of the American United Presbyterian mission included agricultural training on land acquired at Gereif, about five miles south of Khartoum on the Blue Nile. This school opened its doors in September 1924 and became known as the J. Kelly Giffen School of Agriculture. Another venture was the Boys' Commercial School, still flourishing, which developed as an extension of the boys' school in Omdurman. After World War II the mission extended its work to El Obeid. With the natural movement in all missions to transfer their work to an indigenous church, the institutional work of the American mission is now under the control of boards under the auspices of the Evangelical Church.

Another mission - the interdenominational Sudan United Mission (SUM) - appeared in the Sudan at this time, and was mainly involved in the Nuba Mountains. The SUM were anxious to extend their work from Nigeria across the belt of the 'geographical Sudan' to include Chad and the Anglo-Egyptian Sudan. Their work in the latter was entrusted to the Australian and New Zealand branch, which was allowed to open work at Melut and Dinka country in 1913, followed by two other stations in the same area (Rom and Meriok) in 1916. But a few years later the government, anxious to control the 'pagan' Nuba and to develop the administration of the Nuba Mountains area, invited the SUM as a possible 'pacifying' agency to work in the eastern part of the hills. The Nuba Mountains area (now mostly in Southern Kordofan Province) is about the size of Scotland with many groups of peoples. Ten linguistic groups can be distinguished. At government suggestion, SUM opened their first station at Heiban in 1920. Other stations followed in successive years: Abri, among the Koalib people (1923); Tabanya, among the Krongo (1930); Umm Dorein, among the Moro (1933) - not to be confused with the Moru of Equatoria; Kauda, situated between the Otoro and Tira Hills (1936). An attempt was made to open a station in the Tira Hills in 1950, but given up. A Bible school for training evangelists was opened at Shwai near Heiban in 1948, closed for a time and reopened in 1951. In post-war years a leprosy treatment centre was built at Nyakma, between Heiban and Abri.

The SUM were expected to help the Nuba develop in an independent way from their Muslim neighbours and to use their Christian influence as a 'civilizing' agent. They began the first school for Nuba children at Heiban in

1923, and other small schools followed at the other stations, together with some 'bush' schools in villages. Use was made of the vernaculars and English was also taught. Simple medical work was carried out at small clinics in their main stations. The SUM, while successful in their evangelistic work, were not institution-minded, and did not have the finance or personnel to run schools at the levels which would soon be required, or to cover all the Nuba areas. Already at this time the government was opening elementary schools in town centres like Talodi, Dilling and Kadugli. Although the hope was that the majority of pupils would be Nuba, in fact the schools proved to be catering for town boys who were either Arab or Arabized Nuba. Muslim religious training was soon added to the curriculum.

The desire of the government to check Arabization among the Nuba, yet to enable them to stand on their own feet entailed two questions at this time. One was their need of Arabic to communicate with their Arab neighbours, Arabized Nuba, and even between different Nuba tribal groups. The other was the question of continued mission 'civilizing' influence. Coptic Christian teachers were brought in, first in 1933, to teach Arabic in mission schools, and they were later used to staff new government elementary boarding schools for the Nuba, built in the neighbourhood of mission stations. At first there was a strange compromise by which Arabic was taught in Roman script. This was ended in 1935 when at a conference inspired by Douglas Newbold, then Governor of Kordofan, it was decided that Arabic should be taught in Arabic script in Nuba schools and that, after some preliminary vernacular education, Arabic should replace English as the medium of instruction. This was sensible and fair. Some missionaries, and not only in the SUM, remained afraid and suspicious of Arabic as an islamizing influence, forgetting perhaps the extensive Christian use of Arabic in the Middle East; in later years, however, when Christians from different parts of the Nuba were brought together, those same missionaries were glad enough of Arabic as a *lingua franca*.

At this time the CMS came into the picture in the Nuba Mountains. Dr Wilson Cash, its general secretary, visited the Sudan in 1933. The outcome was an invitation by government for the CMS to begin work in the western Nuba hills, leaving the SUM in the eastern hills. They were specifically invited to undertake educational work with government subsidy. A party of four, which included Dr E. Whidborne (later Mrs Gelsthorpe) and the Rev. W.D. Kerr, after an exploratory period west of Dilling in 1934, established a station at Salara among the Myimang hills in 1935.⁴ A small school was started there soon afterwards. It was certainly not 'closed shortly afterwards'⁵; it was quite flourishing when I went there in 1938 and continued for many years, first as a day and then as a boarding school, Arabic being the language of instruction almost from the beginning. A few years later, after a preliminary survey in 1939, the CMS started a second station at Katcha, near Kadugli. The Rev. R.S.

Macdonald and his wife (a doctor) began the work and served there until 1944; I was with them from the beginning and stayed at Katcha until 1959 when the schools were handed to the government. Both Salar and Katcha had flourishing medical work, including village visiting, but Katcha was able to make a bigger educational expansion with elementary and intermediate schools and also teaching training. Girls' education was started by Miss R. Hassan in Salara in the 1940s, but she transferred to Katcha a few years later. The intermediate school drew pupils from many parts of the Nuba Mountains, including the eastern hills as there was no intermediate school there, and among its former pupils can claim at least one judge and one bishop! By the late 1950s about half the pupils were having Christian instruction and half having Muslim instruction. Friction was avoided by having set periods for religious instruction, during which Muslim pupils took theirs at the neighbouring government school.

Further developments in CMS work in the northern Sudan included expansion of the CMS hospital in Omdurman between the wars to involve leprosy work and care for the blind and the destitute and more nursing training, as well as the setting up of clinics and welfare centres in two other parts of Omdurman, Abu Rof (1926) and Abu Kadog (1940). In its history the CMS hospital has had many vicissitudes. Financially, it was on the point of closure on a number of occasions; sometimes it was saved by pleas from local citizens and government officials. It later became a government hospital specialising in nervous diseases. Near the hospital is a club with evening classes, started in 1942. This has continued to expand and is in the care of the Episcopal Church.

Missions are expendable, and the transition from mission to indigenous church was a natural development: CMS to the Episcopal Church of the Sudan, American United Presbyterian mission to the Evangelical Church; SUM to Sudanese Church of Christ. The Sudan Interior Mission has had a centre in Khartoum since just before World War II and continues to serve Christians in the city. Its missionaries worked among the Mabaan and Uduk at stations near the Ethiopian border for many years. Sometimes there has been an agreed handover of a station from one mission to another: the SUM handed over its Dinka stations to the SIM, and in 1953 took over the Salara station from CMS.

Notes

1. Hill, R.L., 'Government and Christian missions in the Anglo-Egyptian Sudan, 1899-1914', *Middle Eastern Studies* Vol.I, No.2 (January 1965), p.117
2. Shields, R.F., *Behind the garden of Allah* (Philadelphia, 1937) p.86.
3. Shields, *op.cit.*, p.103.
4. Not in 1933 as stated in Sanderson, L., 'Educational development and administrative control in the Nuba Mountains region of the Sudan', *Journal of African History* Vol.IV, No.2 (1963), p.240.

5. Ibid., n.49.

A bibliography is attached to the original paper in the Durham Sudan Archive.

THE ROMAN CATHOLIC CONTRIBUTION TO EVANGELIZATION IN THE SUDAN

Fr Giovanni Vantini

Introduction

From 1900 to 1938 the Roman Catholic missionaries were all from the Verona Fathers Society. They were joined by Saint Joseph of Mill Hill missionaries in 1938. Most of the Verona Fathers were Italians, a minority were Germans or Austrian or German-speaking. The Italians were mainly from north-east Italy, where the majority of the population are peasants accustomed to hard, individual work in the fields. Italians are known for trespassing regulations issued by civil authorities. The Verona Fathers kept this habit as far as hunting, health or school regulations were concerned in the South, but especially in regards to the Sphere System Ordinance, 1903, which they opposed as government interference in matters of conscience. Lay Brothers built and maintained most of the buildings of the missions. They were men-of-all-work, but some became self-made specialists without other qualifications. The Verona Sisters were, in general, self-made nurses, school-mistresses and helpers in many sectors of mission work.

The relations between the Roman Catholic missionaries and the Sudan government authorities were most cordial at all times. The Verona Fathers appreciated the generous treatment they received from British administrators when Italy and Great Britain were at war.

The Verona Fathers made it a priority to secure the favour of the local chiefs and to keep in close contact with the population. Hence, whenever two or more Fathers were posted in a station, one was always on trek. Evangelisation meant taking care of the sick, the old people and all the needy (especially children) and tolerating whatever in the local habits and tradition did not conflict with natural law and morality. The Fathers learned local languages and customs. A general bibliography of their contribution to Linguistics, Ethnology, History etc. is available and shows the great effort they made in this field. They made as many individual converts as possible to ensure individual salvation. Less effort, comparatively, was made in training leaders. When all the foreign missionaries were expelled from the southern Sudan it was noticed that the Protestants, though having a smaller number of faithful than the Roman Catholics, had a larger number of qualified pastors and community leaders.

The Beginnings: Upper Nile Province

In January 1900 Bishop Antonio Roveggio, with two Verona Fathers, arrived in Omdurman and opened a mission. In May, he opened another in Khartoum to become the headquarters of the future missions in the South, which the Verona Fathers regarded as their missionary field.

In 1899, Bishop Roveggio had bought a steamer from a London shipyard to ensure communications between Khartoum and the South. The steamer, christened 'Redemptor', was assembled in Omdurman in 1900. In December it sailed up the White Nile to Fashoda and explored the Sobat River. The Shilluk Reth offered the missionaries a site at Lul, where they settled on 11 February 1901. Bishop Roveggio proceeded to Rejaf in the hope of opening mission posts among the Bari and the Lotuho, but was not permitted to do so by the government of the Uganda Protectorate which then administered the east bank of Equatoria. He died in May 1902, while preparing an expedition to Bahr el-Ghazal.

Tonga was the second mission among the Shilluk in 1904; Detwok was the third in 1923; Yoinyang was the first post opened among the Nuer of the Bahr el-Ghazal River in 1924. Mgr John J. Hart (Mill Hill Fathers) ascribed the success of the Dinka mission to 'The patience and the kindness of the missionaries, particularly after the coming of the Sisters (1903) broke down the barriers of prejudice and hostility.'¹

In 1938 the Mill Hill Fathers took over the missions in the Upper Nile and devoted most of their efforts to schools. The other four missions in Upper Nile Province were opened by the Mill Hill Fathers after World War II. The total number of Catholics increased from about 2000 in 1938 to about 7000 in 1955.

The Spheres System Ordinance, 1903

This Ordinance assigned to the Roman Catholics the western bank of the Nile in Upper Nile and the whole of Bahr el-Ghazal, excluding the Lakes District (Rumbek), but including the western portion of the Zande territory (Equatoria). This territory was swampy and the main tribes living in it were Dinka and Nuer.

The Roman Catholic missionaries, opposed to spheres, tried to spread their influence beyond the boundaries set them. This 'aggression' often led to resentment by the Protestants and was an embarrassment to the authorities. In the Yambio area, the boundaries between the two spheres were not well demarcated, and had to be modified in 1933. In 1935, under pressure by the Governor-general (Sir G. Syme), the Roman Catholic and (Christian Missionary Society) made a tacit agreement not to oppose the entry of one missionary into the sphere of another, under certain conditions. This policy was endorsed in 1945 between the Roman Catholic Bishop of Wau and the Anglican Bishop

of the Sudan (Bishop Gelsthorpe). In 1949, the Sudan government acknowledged that the sphere system was 'morally indefensible', yet it remained in force till the end of the Condominium, apparently for political and administrative reasons.

Bahr El-Ghazal

In December 1903, Bishop F-X Geyer led an expedition to Bahr el-Ghazal and established a mission post at Kayango and another at Mbili (March 1904). His writings illustrate the policy of the Roman Catholics: haste to occupy all areas still free from Muslim influence; priority to the larger tribes, but also to the smaller tribes if the latter were more open to evangelization.²

In 1905, a mission post was opened at Wau as the government headquarters was supposed to become an important centre. Five young missionaries died at Wau and Mbili between November 1905 and November 1906. In Khartoum the mission authorities contemplated closing down the missions, and consulted the Governor-general Sir Reginald Wingate, who is reported to have answered: 'As a Governor, according to human wisdom, I should advise you to withdraw; but as a Christian, I say: Remain and go on with your work, in spite of such lamentable losses, indeed on account of them, God will certainly take into account the sacrifices of those young lives and later on bless your enterprise.'³ Of all the difficulties, Muslim obstruction was perhaps the most serious.

German missionaries thought that evangelization should be preceded by social development; Italian missionaries believed that evangelization would itself bring about social development. Eventually the Italian viewpoint prevailed. At Mbili the first baptisms were conferred in 1911 on three young men, one the grandson of the Great Zande Chief Rikita, Rumbarumba, whom the government had taken hostage and entrusted to the mission at Wau for education in 1907. None of the Jur tribesmen who lived around Mbili was baptised until 1920.

Evangelization progressed faster among the smaller tribes living west of Wau. (The Dinka, on the other hand, did not submit to the Sudan government until 1922, and had the first mission among them in 1923.) From 1918 onwards the government recruited employees among the pupils who had been educated in mission schools, which enhanced the movement of the minor tribes towards Christianity. Some later made careers as civil servants and politicians. Also from the smaller tribes came the earliest skilled workers and craftsmen who specialised in the Wau Trades School.

In the Zande Land

In 1912 two Verona Fathers opened a mission post among the Zande at Mupoi.

A small school was immediately opened for eight sons of the local chiefs and later also for commoners. The Mupoi mission, more than any other, suffered privations during World War I. Missionaries earned their living by hunting elephants, which later became a pretext for accusations to the government authorities.

In 1923 Dr Baz of Tombora discovered cases of sleeping sickness. An isolation camp was set up at Tombora and a mission post was opened at Yuba to give spiritual assistance to the sick in the camp. Differences arose between the health authorities and missionaries, ostensibly on grounds of health, but the missionaries always suspected that religious motives were behind the restrictions imposed on them in the Zande area. Friction increased until 1935, when an agreement was reached.

The road system and the concentration of the population along roads were of great help to the spreading of evangelization in the Zande land. Another factor which gave impetus to the Roman Catholic influence was the composition of songs in Zande language and according to the Zande tunes, by one of the Verona Fathers. In 1939, the first issue of *AKRISTIANO KUM BATA YO*, a four-page bulletin in Zande language, was printed at Wau. It had been preceded by two other duplicated publications since 1927 - *RA-DOMINIKA* for catechists and *RURU GENE* for people. In the Zande area catechists were recruited only among students who had failed, a mistake which was noticed only belatedly.

Equatoria Province

In 1912 two Verona Fathers settled near the old Gondokoro mission with the purpose of establishing a *fait accompli* before the territory was administered by the Sudan government. The government prohibited all proselytizing activity among the Sudanese. It was only in 1914, probably under pressure from London, that permission was given for a Roman Catholic mission at Gondokoro. In 1919, however, missionary work started among the Bari and developed from Rejaf mission station. Permission was given only for activity on the east bank, the west bank being reserved for the Church Missionary Society. A list of publications in the Bari language, though incomplete, testifies to the Roman Catholic contribution in the field of science and is also a mirror of the fast development of missionary work, beginning with the first issue of *ROSARIA*, a monthly duplicated bulletin with a circulation of 50 copies in 1920, which lasted for three years.⁴ The Verona Fathers produced religious and educational books in Arabic (Arabic and Roman scripts), Nuba (Delen) Dinka, Nuer, Shilluk, Acholi, Jur, Belanda-bor, Lotuho and related languages, Ndogo-olo and related languages, and Zande.

The Torit mission among the Lotuho was founded in 1920. Friction between Protestants and Roman Catholics arose first in Equatoria and was settled by a gentleman's agreement in 1935. Thereafter the Roman Catholic penetrated into the Pajulu and Nyangwara areas and other tribes of the west bank. Okaru, with its Intermediate School and the Junior Seminary, and Palotaka with the Vernacular Teachers Training Centre became the two major centres of higher education. Many workers were trained in crafts, especially building and carpentry, at Rejaf and later (1953) the Torit Technical School.

During World War II, all Italian missionaries were interned in two stations (Okaru and Palotaka). Only the Yugoslavian Prefect Apostolic and an Irish priest from Uganda were allowed to visit the missions. Internment lasted for two years.

Junior seminaries were started at Okaru (1928), Bussere (1933), and Mupoi (1950). For philosophical and theological studies the students were sent to Uganda until a major seminary was built at Tore River in 1953. By 1955 the total number of Sudanese priests were one bishop and 13 priests. In the major seminary there were about 40 students. Religious societies for men were founded by the bishops of Juba (1952), and Wau (1955).

In the 1920s a controversy rose in Equatoria, over the form of Christian names - whether they were to be in the English form (Peter, James) or the latinised Italian form (Petro, Jacobo). The question was ultimately resolved when new converts began choosing their own baptismal names. In 1936-1937, Roman Catholic missionaries in the Upper Nile Province and Bahr el-Ghazal positively resisted, on moral grounds, official pressure to reduce the use of clothes at schools, while the authorities felt they should preserve tribal customs.

Schools in the North

Schools run by missionaries soon became the most important item of missionary activity and, in the South, the most powerful means of evangelization. In the North, missionary activity was restricted by the government to educational and medical work. Schools were meant primarily to ensure Christian education of Christian pupils (nearly all of non-Sudanese origin), and were forbidden to receive Sudanese and Muslim pupils. Nevertheless, in 1911 about 12 per cent of pupils in the Catholic girls' schools were Muslim Sudanese.⁵

Each school was run according to the programme laid down by its Principal. Boys were educated and trained mainly for clerical jobs and commerce, girls were taught to become good housewives, with domestic science the main subject. The higher proportion of girls is probably due to the lack of government schools for girls. Christian instruction was given to all according to the Catholic doctrine (Catechism); non-Christian pupils were not obliged to study Christian religion, but had to stay in the class-room for discipline.

The Roman Catholic Church received no government subsidy for schools. In 1925, the day school at Omdurman and the boys' school at Khartoum were closed for financial reasons, and because it was believed that the Church should concentrate her efforts in the South. This policy was reversed a few years later when, in 1929, on the initiative of the Verona Fathers Society, a new boys' school was opened on Victoria Avenue, Khartoum, called Comboni College. A group of Canadian Brothers of the Sacred Heart formed the teaching staff and created the tradition of high level teaching, especially in English. After the withdrawal of the Canadian Brothers in 1935, the Verona Fathers continued the same tradition. At the request of parents the syllabuses were increasingly adapted to be in line with the government schools. The Arabic programme was laid down in accordance with the Egyptian programme. English was the main language of the College. Graduates of the earliest years usually took up jobs in commercial firms; after 1946 some Comboni graduates joined the University of Khartoum or other universities abroad. All the other Roman Catholic schools in the North were called Comboni schools after 1954. In 1955 there were 385 pupils in the intermediate section and 472 in the secondary. Just over 50 per cent were Muslim, the remainder Christians or from other religions.

In 1929 a new mission station was opened at Port Sudan with schools for boys and for girls. In Atbara, an elementary school for boys and one for girls were started in 1929. At Khartoum North, a small school was started in 1904 to train native girls in domestic science. A similar school was opened in Saggana Deim, in the Khartoum suburbs, as a means of approaching the Muslim Sudanese. It closed in 1940 at the beginning of the war. After World War II, as the demand for primary and secondary education increased, more schools were opened: in 1948, a girls' school began in El Obeid with kindergarten, elementary and intermediate sections, to which was added a boys' school with a coeducational secondary section in 1953. In El Nahud a small school with kindergarten and two elementary classes was opened in 1954. In Khartoum the Sisters School was extended in 1951, and another in *Villa Gilda*. In the same year a trades' school was opened in the Khartoum light industrial area to train children of the working class in handicrafts. When the four-year course ended the pupils refused to go back to work and applied for intermediate education in the government technical school.

The South: 1900-1927⁶

During this time the Church organised schools, and supported them financially, free of government supervision. Up until 1920 the government, far from giving encouragement, merely tolerated the education given by missions.

'Catechumenate' is the name for a centre or meeting place where adults are taught prayers and the first rudiments in Christian religion in preparation for

baptism. During these years nearly all the Roman Catholic schools were a combination of catechumenate and elementary school. In the beginning no Roman Catholic personnel was specialized in education: each missionary did what he was able to do. The language of religious instruction and literacy was usually the vernacular,⁷ but Arabic was taught at Kayango, Lul and Wau. All children who joined the elementary school were supposed to apply also for baptism, though at Wau Mohammed el- Nujumi and his brother Hassan, (grandsons of the famous Mahdist Emir El Nujumi) completed their education and remained Muslims. There were also students who remained pagans.

Manual work was a compulsory subject to keep the students in contact with their environment. In every mission station workers helped the missionaries in construction and some of them were taught handicrafts, especially building and wood-carpentry. Mention must be made of the Technical Schools of Wau, Torit, and of the workshops of Mupoi and the agricultural farm at Lerwa. Nearly all the skilled workers in the South received their education and training in some Roman Catholic station.

The South: 1927-1946

Direct intervention by the Sudan government through subsidies began in 1927. In 1928, only three Roman Catholic elementary schools out of the 27 in existence were eligible: the Verona Fathers had only a limited number of qualified teachers to supervise schools.⁸ After the De La Warr Report (1937), the Verona Fathers began sending missionaries to London to obtain qualifications, but World War II delayed the good effects of this initiative. The proportion of RC subsidised schools rose, but remained lower than that of other denominations. Bush schools, of which I estimate that there may have been 100 by 1946, received no grant. Of the 14 girls' schools opened during this period, 11 were Roman Catholic (one in Bahr el-Ghazal, four in East Equatoria, one in West Equatoria and three in Upper Nile Province).

A post-elementary school was started unofficially at Wau in 1924. In 1927 the government established the Sir Lee Stack Memorial School, staffed by government teachers of Syrian origin and Protestant denomination. The pupils lodged on the premises of the Catholic Mission and were mostly Catholics. Disagreements soon arose on religious grounds and for other reasons, so that the Stack Memorial was closed down after two or three years and handed over to the Mission. In 1933 the Wau Roman Catholic Intermediate school was transferred to its new premises in Bussere. Another Intermediate school was opened at Mupoi and Torit and two parallel centres for girls at Mupoi and Kator.

In 1922, Bishop Stoppani of Wau sent three clever pupils from the Trades' School to Alexandria for a three-year course in the Technical School run by the Salesians to train as mechanic, carpenter and shoe-maker respectively. In

1928-1930 the Wau Trades' School was better organized, housed in new premises and equipped with all sorts of machinery, including a locomotive steam engine to supply energy. The carpentry section of the Wau School became famous for providing furniture to all missions, as well as government offices and private houses. In Bahr el-Ghazal some former mission workers organised themselves into contracting companies, able to complete a project from plan to roof.

The South: 1946-1955

During this period the Dinka, who had been conservative until 1946, showed an increasingly positive attitude towards children's education. The quick expansion of education led to a rash of conversions to Christianity, both among the school pupils and the adults who came in close contact with the Church.

The boom of education in the South began with the government subsidies which covered 75 per cent of the recurrent expenditure. A report by the Education Secretary of the Comboni Schools (North Sudan) shows the expansion in the South:

YEAR	PUPILS
1903	20
1923	813
1933	4404
1945	c 8000
1954	c 26000

The Roman Catholic mission schools were taken over in 1957; there were then two boys' intermediate schools, two technical schools, one girls' teacher training college and four vernacular teacher training centres for boys, 39 boys' elementary and 26 girls' elementary schools and 199 bush schools. In 1964 all foreign missionaries were expelled from the South.

Notes

1. From an unpublished report by Mgr John H. Hart, 1955, p.9.
2. See, for example, *La Nigrizia*, Dec.1904, pp.184-186.
3. Santandrea, S., *A popular history of Wau (Bahr el-Ghazal, Sudan)*, (Rome, 1977) p.38.
4. Given in the original paper in the Durham Sudan Archive, p.6.
5. CMS and Evangelical schools were allowed to receive Sudanese, see Sanderson, L., 'Some aspects of the development of girls' education in the Northern Sudan', *Sudan Notes and Records*, Vol. 42 (1961) p.95.

6. See Appendix to this paper for a chronological list of the Roman Catholic mission stations in the South to illustrate the expansion of education.

7. *La Nigrizia*, March 1905, p.40.

8. The conditions were: uninterrupted European supervision, following the prescribed syllabus and satisfying the resident inspector, who might reduce or withdraw the grant of £100 p.a. to boys' schools and £30 p.a. to girls' schools.

Appendix I: Roman Catholic mission stations in the south (in chronological order)

(Libio)	1851	RAGA	1935
(Gondokoro)	1853	MALAKAL	1936
(Kenisa/H. Cross)	1854	CUKUDUM	1946
LUL	1901	LIRYA	1946
KAYANGO	1904	MAYEN	1946
MBILI	1904	LOWOI	1947
TONGA	1904	NAANDI	1947
WAU B el-G	1905	RI MENZE	1947
(Dumbe)	1911-12	LAFON	1948
MUPOI	1912	THIET	1949
MBORO	1912	TOMBORA	1950
(Morjan Kali)	1913	MARINDINGO	1950
RAFFILI	1914	KWORIJIK	1951
REJAF	1919	YAMBIO	1951
TORIT	1920	PORKELE	1951
LOA	1921	NZARA	1951
YUBU	1923	KADULE	1952
KWAJOK	1923	WARAP	1952
DETWOK	1923	KATOR	1952
(Nagishot)	1924	RUMBOK	1953
YOINYANG	1925	TONJ	1953
ISOKE	1926	TORIT River	1953
DEIM ZUBEIR	1926	TORIT TECH.	1953
OKARU	1928	MARIDI	1953
JUBA	1931	YEI	1954
(Ringi)	1932	AWEIL	1954
BUSSERE	1933	EZO	1954
PALOTAKA	1934	KPAILE	1954
KAPOETA	1935	TORIT TOWN	1956

Names in brackets are stations which were later closed down.

IN DISCUSSION : MISSIONARY WORK

(Chairman: Christopher Cook)

Oliver Allison (1938-1974): My travelling was very heavy - almost all round the world in point of view of distance every year, and so I had to be very careful to avoid extra expense, and travelled on lorries and buses and any other way. Of course, Sudan Railways gave us the remarkable privilege of the Church Saloon including a bar. Often I held services on verandahs. There was a famous occasion in Wau when Richard Owen had a rather infamous parrot, most unregenerate, with very apt comments. My predecessor Bishop Gelsthorpe was preaching on the Wau verandah and the parrot was put discreetly round the corner. In the middle of his address suddenly the shout went up, 'You talk bunkum, sir,' adding, 'Yes, you do!' So the parrot was removed to the end of the garden.

Christopher Cook (1940-1964): When the census was taken around 1960 one interesting fact struck me, that in Yei district of Equatoria Province there was a higher rate of literacy than in any other place in the Sudan, except in the Three Towns. 'The poor backward South' - and there, at any rate in one place, a higher literacy rate than in anywhere in the North. Why was this? The missions had a clear purpose: to tell the Christian story and to enable all to read it for themselves. Secondly, it was the policy of the government that this should happen not in the North but in the South. And thirdly, the Christian story was for everybody - for men and women, for young and old. By the time I arrived in 1940 there were women on the church councils, and they were literate women. By the time of the end of the Condominium period in Yei district there were more girls in school than there were boys. And finally, the work had to be done in the vernacular. This problem in the muddle of languages did not bother the missions.

Ronald Keymer (1946-1963): 'Uncle' Harpur was an indelible part of the Condominium period, a friend to everybody. A letter was addressed 'Uncle, Sudan', and it found him! When the British companies decided to start their own nursing home, the unanimous decision was that we should call it the Harpur Nursing Home.

Alec Cruikshank (1924-1948): In the southern Sudan practically every denomination of mission had each its own dispensary, excellently run and of far better quality than the government could provide. The great pioneer was Dr Fraser and he worked with lepers. The dispensaries were always besides the chiefs' centres and each acted as an information unit for the whole hospital. When I went south I copied his method quite a lot.

Billy McDowall (1939-1955): In some of our earlier sessions we have talked about the pace of Sudanisation. Certainly the Anglican missions did produce indigenous leaders, pastors, for the Church, and I would like to ask was this deliberate policy against the timetable, or was it a case of necessity - that your own expatriate resources were so few on the ground that you simply had to train Sudanese? Certainly it stood you in good stead, because when the trouble started in the South you had a tremendous number of trained Sudanese pastors.

Oliver Allison: Bishop Gelsthorpe said, 'You have got to get on with the job of training pastors and Church leaders.' The earliest missionaries thought we had to go slowly, and of course it was slow work. Don't forget that it took ten years for one Sudanese to be baptized - I lived with him and met him. It was deliberate policy to make sure that the Sudanese leadership was there to take over.

Charles Sharland (1931-1953): The first step of Sudanising the church was in the early 1930s. Then we had an annual conference for missionaries, and it was decided that we should have Sudanese representatives on the conference. So it was finally resolved that each district should send two Christians and three missionaries!

Christopher Cook: On a much more material level, we had no difficulties over property because while Billy McDowall was Chancellor of the Diocese the whole of the mission property had been legally transferred into the hands of the Sudanese Church. So we didn't have the problems that have arisen in some other countries.

Sirr Al-Khatim Al-Khalifa: I worked with the missions in the southern Sudan very closely for a period of eleven years when I was in Juba in charge of the spread of the Arabic language. It is true that the Societies were subjected to a lot of criticism especially before independence. Now we realise the good work which they have done in the southern region of the Sudan - in some ways I may say that it was work greater than that done by the government. Despite the fact that I was aware all the time that some of them were not really convinced that the government policy over language was the right one, the cooperation which we got from the missionary Societies in carrying out the Arabic policy was one of the main factors which led to the success of that policy. We started our efforts in introducing Arabic through the experience of Dr Stevenson and people like himself in the Nuba Mountains. The first course of Arabic for southern teachers was organised in Malakal in January 1950, and with me at the time I had two helpers from the missions in the Nuba Mountains. There was a great deal of cooperation also when we started the unification of the two systems in the North and in the South. There was enough reason for quite a number of missionaries who spent their whole lives in the southern region to stand up against that policy. But I felt that they were men who had higher objectives. The third area, which was more sensitive and more ticklish, perhaps, was indeed the question of

religious freedom. Naturally, there was a lot of feeling amongst the southerners that perhaps the introduction of Arabic might be the thin end of the wedge for introducing Islam. I wouldn't be surprised if it was also the feeling amongst some of our missionary friends. But through patience and through tolerance and through working closely together we could get over all our personal difficulties and devise a system which ensured, in the schools at least, absolute religious freedom. I end with a comment on statistics. The last census in Kordofan Province was carried out by a very enthusiastic young man, I think he was a graduate of Harvard, and he went to count the cows in the district in Kordofan where Babo the famous Nasir happened to be in charge. This young man turned to him and said, 'Nasir Babo, you told us that you had two million cows but I find that there are four million. I am sure that you told us this in order to avoid the taxes.' He said to him, 'How did you count them?' He replied, 'We adopted the latest and most modern methods: we flew over the whole area and counted the cows.' Babo Nasir said to him, 'Oh well, that explains how you have got double the number because you counted the cows and you counted their shadows!'

Alleyne Nicholson: I am very glad to learn that there is acceptance that the Arabic language should now be taught throughout the Sudan. I felt that fairly strongly when I was a District Commissioner in Renk in 1933-1935. We, of course, were there side by side with the Arabs both to the North in the White Nile and to the east in the Blue Nile Province (the Fung district), and my experience was that the Arabs and Dinkas in that part who had to live together got on extremely well. It wasn't uncommon to meet a Dinka with an Arabic name.

Mohammed Omer Beshir: Do we have any statistics about how many Christians there are in the Sudan? To my knowledge since the 1956 census we have different figures. I am not talking just about the South - and by the way I hope that we stop talking about 'the North' and 'the South'; it is high time we talked about 'the Sudan'.

Father Vantini: We in the Roman Catholic Church have accurate statistics up to 1964 from the annual returns which every Bishop is obliged to send to the Vatican. Thereafter, there are no accurate yearly statistics. The best estimate was made in July 1979 - in the region of 700,000 Catholics.

Oliver Allison: We reckoned that at the end of the Condominium there were probably not more than 50,000 baptized Christians. Probably there were more believers. Today we don't really know. But we can say fairly safely as far as the Episcopal and Presbyterian Churches are concerned there are probably about half a million. But in default of census figures we are not even sure of the total population of the country.

Mohammed Omer Beshir: It is about 80 million according to a census (not analysed and published yet) conducted two years ago.

APPENDIX I

BRIEF NOTES ON THE CONTRIBUTORS

ALLISON, Rt Rev. OLIVER CLAUDE, CBE: C.M.S. missionary, Juba, 1938-1948; Assistant Bishop in the Sudan, 1948-1953; Bishop in the Sudan, 1953-1974.

BEDRI, Dr ALI: Sudan Medical Service from 1928; Medical Inspector at Merowe, Kadugli and Sennar 1937-1944; Deputy Assistant Director (Quarantine) 1946-1948. Minister of Health 1949-1953.

BLOSS, Dr JOHN: Sudan Medical Service, 1933-55; Deputy Director, Ministry of Health, 1953-1955. Publications include *Tsetse-fly in the Sudan* (1945) and *A history of sleeping sickness in the Sudan* (1960).

BREDIN, GEORGE R.F., CBE: Sudan Political Service, 1921-1948. Governor of Blue Nile Province, 1941-1948; Governor-general's Council, 1943-1948; Chairman, Gordon Memorial College Trust Fund.

BRYSON, P.C.: Chief tester at the Clyde Shipyard of Barclay, Curle & Co. Entered the Sudan service, 1934; superintendent engineer of the Steamers Division of Sudan Railways, 1949-1955.

CARMICHAEL, Sir JOHN, KBE: Sudan Civil Service 1936-59 Secretary Sudan Development Board, 1944-1948; Director Sudan Gezira Board, 1950-1954; Permanent Under Secretary to Ministry of Finance, 1953-1955; Chairman Sudan Light and Power Co. 1952-1954; Financial and Economic adviser to Sudan government 1955-1959.

COOK, CHRISTOPHER, L.: former Education Secretary of the Church Missionary Society in Southern Sudan. CMS Mission in the Sudan 1940-1964; Secretary Gordon Memorial Mission, 1959-1964; Headmaster Loka School and engaged in teacher training. Later CMS Mission, Nigeria.

CRUICKSHANK, Dr. A.: Medical Inspector Atbara, Kordofan and Yambio, 1924-1929. Senior Medical Inspector, Equatoria, 1930-1940. Senior Medical Inspector, Port Sudan, 1941; Director and Senior Physician, Khartoum Civil Hospital to 1947.

DAWES, E.J.: entered the service of the Sudan Railways, 1929; traffic inspector and later district traffic manager; assistant commercial superintendent; joint manager and later General Manager of Sudan Airways, 1946-1952.

FARQUHARSON, Sir JAMES: Assistant engineer, London Midland and Scottish Railway 1923; General Manager Tanganyika Railway 1945; Deputy General, East African Railways 1948-52; General Manager Sudan Railways 1952-1957; General Manager of the East African Railways and Harbours 1957-1961; assistant Crown Agent and Engineer-in-Chief for overseas governments and administrations 1961-1965.

FARQUHARSON-LANG, W.M.: Seconded to Sudan Education Department 1931; transferred to Sudan Education Department 1938; Gordon Memorial College 1939-1943. Governor-general's temporary commission in S.D.F. 1940-41; Inspector, Education Department, 1943-44; Headmaster, Wadi Seidna School 1945-50; Assistant Director of Education 1951-1955; Retired 1955.

GLANVILLE, Major W.H.: Veterinary Inspector Kassala Province 1928-29; Halfa Province 1930-31; Upper Nile Province 1931-1934; Khartoum 1935-41; El Obeid 1942; Khartoum 1944. Director Veterinary Service 1945-1952.

HILL, R.L.: entered the Sudan Civil Service in 1927 as a traffic trainee on the Great Western Railway 1927-28; district traffic manager Sudan Railways 1929-1944; seconded to the University College (later University) of Khartoum 1945-1949; Lecturer in Middle Eastern History at the University of Durham 1955-1966 and a founding father of the Durham Sudan Archive. His many books include *Sudan transport* (1965).

HOBRO, F.G.W.: joined the British Post Office 1934; seconded to the Sudan Government Posts and Telegraphs in 1942; district engineer at Atbara, Port Sudan and Khartoum; Principal of the Posts and Telegraphs Training School; adviser to the Controller of Posts and Telegraphs stores, 1965-66.

HODGKIN, R.A.: Tutor, Gordon Memorial College 1939; Translation and Publication Bureau, Bakht er Ruda 1946; Managing Editor Publications Bureau, Bakht er Ruda, 1947; Principal and Assistant Director of Education, Bakht er Ruda 1950-1955.

HOWELL, P.P., OBE, D.Phil.: Sudan Political Service Khartoum 1938-39; Civil Secretary's Office, 1939-40; Aide de Camp and Assistant Private Secretary to the Governor-general, 1940-41; Upper Nile 1941-1946; Kordofan 1946-1948; Upper Nile (Chairman, Jonglei Investigation Team) 1948-1953; Chairman, Southern Development Investigation Team (rank and status of Deputy Governor) 1953-1955.

KEYMER, K.C.: Chairman, Sudan Mercantile Co., London.

McCALL, A.G.: Inspector of Agriculture Abu Magid 1938; Fatisa, Gezira Prov. 1941; Meridi, Equatoria 1942; Yambio, Equatoria 1946; Secretary Equatoria Projects Board 1949; Senior Inspector of Agriculture, Blue Nile Province 1950; Assistant Director (Projects) Ministry of Agriculture 1951; Director, Ministry of Agriculture 1953-55.

MACPHAIL, J.G.S.: Berber, 1923-24; Red Sea, 1925; Bahr el-Ghazal, 1926-1929; Kordofan, 1930-1933; Upper Nile, 1933-1939; Northern, 1939-1942; War Supply Dept., 1943-1947. Assistant Deputy Sudan Agent in London, 1946-47; Retired, 1947. Order of the Nile, 4th Class, 1935.

MARJORIBANKS, W.L.: went to Sudan 1932; Assistant Conservator of Forests Khartoum 1933; Sennar 1933; Singa 1934; Khartoum 1938; Conservator of Forests, Khartoum 1944; Chief Conservator of Forests, Khartoum 1946-1955.

MATTHEWS, I.S.G.: went to Sudan 1937; Assistant Divisional Engineer Mereba, Abu Ushar Division 1938; Korashi 1939; Dueim 1940; Basatna, Wad Medani Division 1941; Tabat, Abu Ushar Division 1944; Wad Medani, Projects Division 1946; Assistant Resident Engineer, Sennar Dam Division, 1947; Divisional Engineer, Wad Medani, Projects Division 1950-55.

SANDERSON, LILIAN PASSMORE: Teacher, Omdurman Girls' Secondary School, 1953-54; Headmistress, Omdurman Intermediate School, 1954-1958. Headmistress, Khartoum Girls' Secondary School, 1958-1962; Sessional teaching at the University of Khartoum, 1962-63.

SAYED-ALI, MEKKI AL-: graduated from the Gordon Memorial College 1932; joined Sudan Railways 1933; operations superintendent Atbara 1955; Port Manager 1957; Director and Deputy General Manager of the Sudan Shipping Line; transport adviser to Sudan Ministry of Industry 1971.

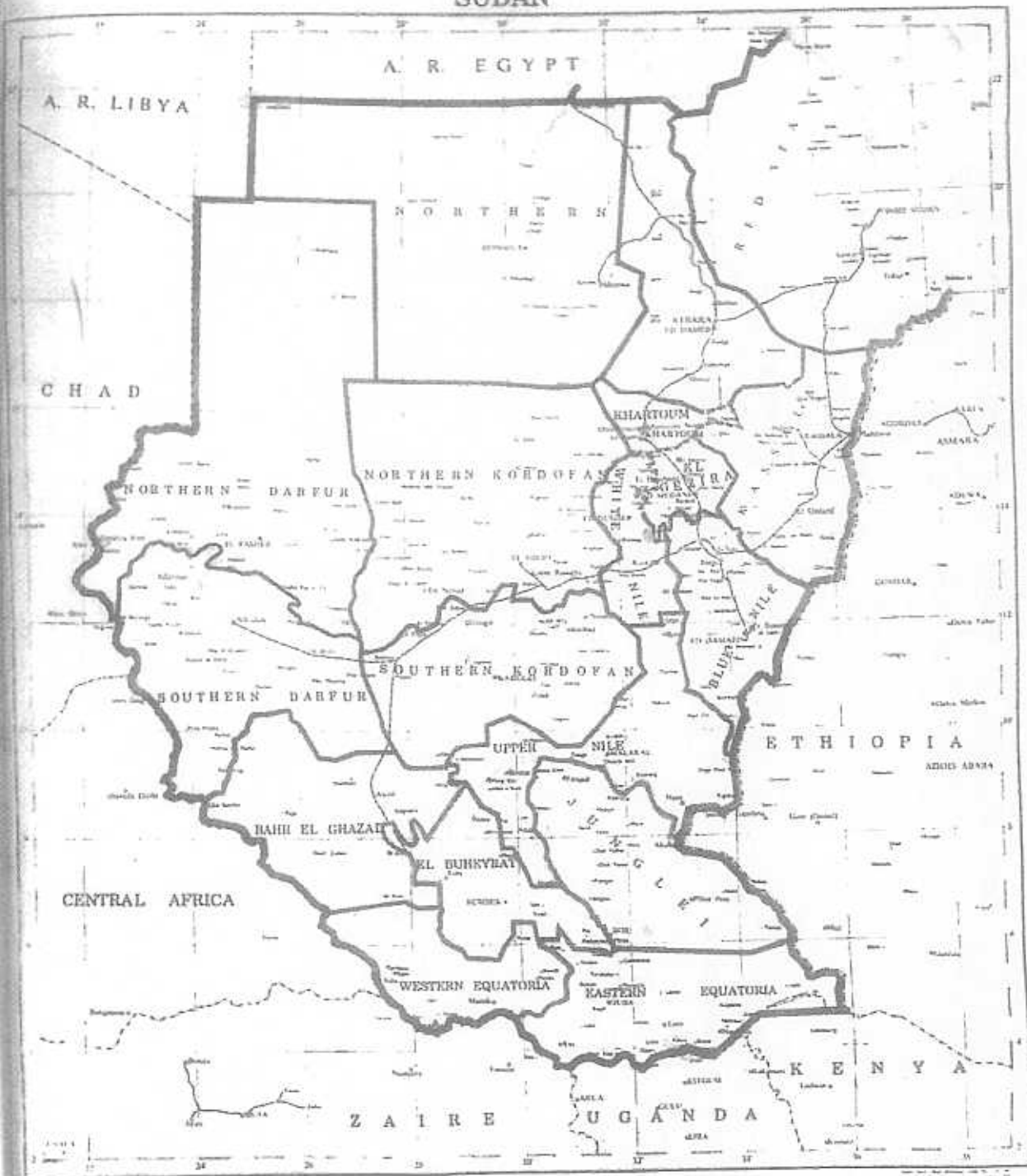
SMITH, C.: Sudan Plantations Syndicate 1929; various posts until 1950 when the Gezira Scheme was nationalised; Agricultural Manager of the newly formed Sudan Gezira Board; after retirement joined Barclays Bank for about seven years as cotton adviser in Sudan.

THEOBALD, A.B., OBE: Tutor at Gordon College 1929; Lecturer (History) School of Arts 1942; Principal School of Arts 1944; Vice-Principal Gordon Memorial College 1946-1951; Dean, Faculty of Arts and Reader in History, University College of Khartoum 1952-1955.

VANTINI, Fr GIOVANNI: Verona Father; Sudan Catholic Information Office, Khartoum.

WOOD, G.K.: a pupil of Sir Nigel Gresley, 1923-26; entered the Sudan Civil Service (Railways Department) as district locomotive superintendent 1929; Works Manager and Chief Mechanical Engineer 1948-1955; member of the Sudan government Committee on Technical Education; member of board of the Faculty of Engineering, University (College) of Khartoum.

SUDAN



Legend:
 Political boundaries
 Administrative boundaries
 Railways
 Roads
 Rivers
 Lakes
 Marshes
 Forests
 Cultivated land
 Uncultivated land
 Desert
 Mountains
 Hills
 Plateaus
 Plains
 Valleys
 Canals
 Dams
 Bridges
 Airports
 Seaports
 Harbors
 Bays
 Straits
 Tunnels
 Pipelines
 Power lines
 Telegraph lines
 Telephone lines
 Cable lines
 Radio lines
 Post lines
 Mail lines
 Ferry lines
 Bus lines
 Train lines
 Ship lines
 Air lines
 Space lines
 Other lines

